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## 1.0.1 What is Innovation?

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### Abstract

What is innovation in the first place? Why is innovation important? What are the key characteristics of innovation as a phenomenon? And what should we focus on in order to realize innovation? In answering these questions, this chapter aim to clarify and organize the key points that we seek to explore.

### Keywords

Innovation, value, revolution, economic growth

### 1 What is innovation?

Innovation is generally understood as "introducing something new or transforming something that already exists." In Japan, innovation is still often translated as "technological innovation," but its original meaning is much broader and not limited to technological innovation. In fact, the Economic White Paper, which marked the first use of the term "technological innovation," explicitly declares that "although we use the term 'technological innovation', it is a broad process that includes changes in the consumption patterns." Nonetheless, it is undeniable that a solitary translation has trivialized the meaning of innovation. Innovation in the original sense of "introducing something new or changing something existing" can be found in all areas of society, including education, the arts, politics, the military, and sports. However, in this discussion, we limit our focus to innovation within the economic system. This includes innovation in the products and services that are the objects of economic transactions as well as innovations in the methods, processes, and organizational forms through which these products and services are developed, produced, and sold.

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When it comes to defining innovation in the context of the economic system, the most frequently cited figure is Joseph Schumpeter. Schumpeter defined innovation as “new combinations” of existing or new knowledge, resources, and equipment (Schumpeter, 1934). In other words, innovation is the creation of new combinations—bringing together knowledge, materials, and forces in ways that differ from the past. Schumpeter identified five types of such new combinations: (1) the development of new products or new qualities of products not yet known to consumers, (2) the development of hitherto unknown production methods (not necessarily based on scientific discoveries, and including new ways of handling products), (3) expansion into markets in which a company has not previously participated, (4) the acquisition of new sources of raw materials or semi-finished products, and (5) the creation of new organizational forms. This paper follows Schumpeter’s classic definition and defines innovation as “a form of change that brings value to society.” This definition highlights two important aspects of innovation: *value* and *change*

## 1.1 The pursuit of value

The first aspect of innovation is *value*. Innovation is only realized when a novel idea is transformed into a concrete product, process, or service—and is subsequently accepted by society. Merely being new or involving change does not automatically qualify something as innovation. Purely imaginative or spontaneous ideas, as well as the discovery of new phenomena or the invention of new principles, do not in themselves constitute innovation. Schumpeter also emphasized the distinction between invention and innovation. Invention can occur in any context, independent of commercial intent. Innovation, on the other hand, is a specific social activity carried out with commercial objectives in the context of economic activity (Schumpeter, 1934). Invention is the only necessary condition for innovation. For invention to be recognized as an innovation, the consumer must recognize it as having additional value that exceeds the value of the resources (e.g., people, goods, money, information) invested in its creation. It is at this point that a novel idea is widely accepted by society and recognized as an innovation after the fact.

## 1.2 Change

The second aspect of innovation is *novelty* or *change*. The scope of innovation extends far beyond the narrow definition of technological advancement. It includes not only new technologies, products, and services, but also the methods used to produce them; the systems for delivering, maintaining, and supporting them for customers; as well as innovations in the organizational and corporate structures that realize them, the business models that generate revenue, approaches to talent development, and even innovations in social institutions. As will be discussed later, these various forms of innovation are interrelated and together form a large, integrated system. The term “innovation” often evokes the image of a significant leap from conventional practices. Indeed, the kind of innovation envisioned by Schumpeter was discontinuous in nature—breaks from the past rather than extensions of it. One of his most famous quotes illustrates this: “No matter how many mail coaches you line up, you will never get a railroad by doing so.” (Schumpeter, 1934). From this perspective, it might seem appropriate to define innovation strictly as discontinuous,

breakthrough change. However, if we consider the economic effects of innovation and its influence on everyday life, continuous and incremental improvements following such breakthroughs may, in fact, be even more important. Innovation permeates socio-economic systems not solely through radical, discontinuous advances, but through a combination of such breakthroughs and steady, progressive improvements.

## 2 Why is innovation important?

### 2.1 Driving economic growth

Innovation plays a crucial role in driving economic growth. As many developed countries, including Japan, are no longer achieving the level of economic growth they once expected, governments have increasingly turned to innovation as a key solution. This is also the background behind Japan's shift in science and technology policy toward what is now called "science, technology, and innovation policy," with a stronger emphasis on economic outcomes than in the past.

Innovation has a particularly important role to play in enabling Japan to achieve economic growth. Economic growth can be achieved either by increasing capital and/or labor inputs or productivity. Productivity growth means producing more output with the same amount of capital and labor, which is made possible through technological progress and similar factors. Given Japan's current situation, it is difficult to anticipate economic growth through increased labor and capital because it is clear that the country's working-age population will decline over the long term, while the capital growth rate is expected to slow as the savings rate decreases. If this is the case, the only solution is to increase productivity, which will likely depend on creating innovation.

### 2.2 Transforming social life

Innovation has the power not only to promote quantitative economic growth but also to fundamentally transform the quality of our lives. Innovation has consistently helped solve various social challenges and problems. That is why societies continuously seek innovation. Of course, the effects of innovation are not always positive, and can also bring about anxiety and danger. Discussion pertaining to the social evaluation of the good and the bad effects of innovation are beyond the scope of this paper, but regardless of whether we evaluate and praise innovation positively or view it negatively and with skepticism, it remains important that we understand the mechanisms that give rise to it.

### 2.3 The rise and fall of companies

Innovation has a profound impact on the rise and fall of companies. Many companies are born and grow as a result of innovation. Large companies that have grown in this way establish a stable position in the industry by providing superior products and services on a sustained basis. However, their position is often threatened by the emergence of new startups with new innovations. Companies suffer financial crises for

many reasons, but attacks from other companies through innovation is one of the most significant. Innovation frequently causes shifts in the leading roles within industries.

Behind every company's long-term success lies innovation. At the same time, an unforeseen wave of innovation can sweep away that success overnight. The key strategic challenge for business leaders, regardless of company size, is how to continuously generate innovation and how to respond to the unrelenting pressure of external innovations.

### 3 The nature of innovation

#### 3.1 A Knowledge-Based Endeavor

Innovation becomes visible to us in the form of products, services, and production facilities. However, what underlies all these tangible manifestations is newly created knowledge. The direct output of innovation is intangible knowledge, which is embodied and made available to us in the form of products and services. Thus, the first fundamental characteristic of innovation is that it results from an activity that creates intangible assets in the form of knowledge. This distinguishes innovation-related activities from other types of economic activity.

#### 3.2 Uncertainty

The second characteristic of innovation is the high degree of uncertainty that accompanies its realization. The process of realizing innovation is not something that can be meticulously planned and prepared in advance. Rather, it is a process of overcoming various unexpected obstacles and hardships, sometimes guided by chance, and moving forward through ups and downs. Moreover, the innovative ideas at the root of innovation are full of uncertainty with regard to their feasibility and economic value.

#### 3.3 Social Nature

As long as innovation is translated as “technological innovation,” it will have an inorganic ring to it. We tend to think of technological innovation as occurring outside of our everyday social lives. However, it is people and companies that create and embrace innovation. As long as people and companies—both the creators and recipients of innovations—are embedded in society, innovation will be a social act or activity that cannot be considered separately from social processes. Innovation involves not only great inventors or exceptional entrepreneurs but also many ordinary individuals who play critical roles.

As such, the creation of innovation is subject to the circumstances and constraints of human and societal capacities at a given time. Humans have limited capacity for processing information and can only make rational decisions and take action within a bounded scope. Moreover, interpretations of the meaning and value of new technologies vary from person to person, and this variation can sometimes influence the direction of innovation.

### 3.4 Systemic Nature

Innovation only brings value to society when a variety of factors are combined. In other words, it always constitutes, and functions as, a system. This systemic nature brings interdependence to innovation. Innovation depends on, and simultaneously influences, various related elements in its environment. No matter how excellent a standalone product or service may be, if it lacks compatibility with existing systems or if new complementary systems are not developed, it will not be accepted by society. This is why it is essential to understand innovation within a broader context and in relation to the systems that support it.

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