Chapter 3
Japan's State Learning in the Meiji Period from the Vision Perspective

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3.1 Introduction

This chapter analyzes the relationship between the reality of the industrialization vision launched by state leaders and policymakers and the state learning process in the early stage of Japan's industrialization. As explained in Chap. 1, translative adaptation in industrial policy proceeds through Vision, Strategy, Policy instrument, and Implementation stages (see Fig. 1.1). This chapter highlights the Vision stage, the formulation of which is the most upstream aspect that affects the development of strategy, concrete policy instruments, and decision-making in conjunction with state investment, positively and negatively. Here, industrialization vision is defined as the state view on industrial composition and key actors. These include such questions as what kinds of industries state leaders and government officials want to develop in the country in the future; what development paths they want to pursue to achieve industrialization; who they expect to lead industrialization—for example, the state vs. the private sector, or domestic vs. foreign investors; and what is the role of government [2].

Ohno [34, p. 84] states that development strategies that are not underpinned by the strong will and clear vision of state leaders are never successful. State leaders can include not only the country's highest decision-makers but also other key policymakers. Looking at examples of developing countries that are considered to be successful industrializers post-World War II, we can identify several countries and economies where the industrialization vision was actually set out by them and the industrialization process was led by them. In the case of South Korea, these were Park Chung-hee and O Won-chol; in the case of Taiwan, Yin Chung-jung (K. Y. Yin) and Li Kwoh-ting; and in the case of Singapore, Goh Keng Swee played such

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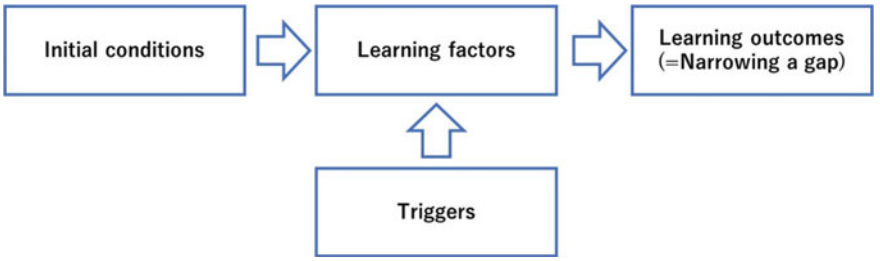

Fig. 3.1 Preliminary thoughts on the initial conditions, learning factors, and triggers in the learning of the vision formulation and policymaking practices (*Source* Author. Modified Diagram 5.2 of Amatsu [3])

roles. In contrast, there are countries that have set out a vision of industrialization and seriously promoted industrialization on the basis of that vision but have failed to industrialize or have fallen into prolonged stagnation. As Lin [22] claims, many political leaders have pursued their stated goals with benevolent and noble intentions, but finally failed to industrialize. He cited Mao's China, Nehru's India, Nasser's Egypt, and Nkrumah's Ghana as specific examples. Meanwhile, as long as a vision is a vision, it is inevitable that the direction and target level of industrialization that the vision aims for will diverge from the actual situation of the industrial sector when countries first launch their visions. In this chapter, this divergence will henceforth be simply described as a 'gap,' and it will be assumed that successful industrializing countries are those that achieved gap reduction in the early stages of industrialization, while unsuccessful countries are those that failed to do so and, as a result, left a serious mark on the subsequent industrialization process.[1] Then, whether a country is able to achieve gap reduction is considered as a difference in state capability, and the reduction process as the state learning process. The question is what was different between successful and unsuccessful industrializing countries in their state learning processes.

The analysis of this chapter is based on the experience of Japan from the end of the Edo to the middle of the Meiji period[2] (the end of Edo-Meiji hereafter) in the nineteenth century. What vision of industrialization was formed in Japan at that time, and did gaps arise? If so, how did these narrow during the process of industrialization? What were the factors that led to narrowing these gaps? These questions are argued with the framework developed by Amatsu [3] in mind, which explains the relationship among the initial conditions, learning factors, triggers, and outcomes of state learning, assuming that narrowing a gap is the key state learning process (Fig. 3.1).

[1] One size does not fit all. Thus, there are countries which do not fall into that category.

[2] Japan has its own year system separated from the western-styled 'year.' The periods are usually called either 'era' or 'period' in English. The word 'period' is used in this chapter. 'Meiji' is a period that started in Meiji 1 (1868) and ended in Meiji 45 (1912), while Edo is not strictly a period but the name characterizing the substantive rulers. Both year and Meiji are sometimes written together in this chapter because the style of 'Meiji xx' is convenient for understanding what happened at any point since Meiji 1.

This framework assumes that learning outcomes are affected by three variables, that is, initial conditions, learning factors, and triggers. The initial conditions are found in the situation before the industrialization process starts and would affect the state learning process. The learning factors and triggers influence the process of narrowing one or more of the gaps. The former can be controlled within the government, and the latter are those that cannot be controlled within government. Whether those factors work at what time and to what effect is an important key for narrowing any gaps [2].

3.2 Why Does Japan's Experience Matter?

There are two periods in Japan in which the industrialization vision is considered to have played a particularly important role: (i) post-World War II, and (ii) the end of Edo-Meiji period. In post-war Japan, the Ministry of International Trade and Industry (MITI) played a central role in vision formulation. The visions were published as official government documents and were revised in response to changes in the policy agenda. Each vision depicted a leading industry characterizing each decade: heavy and chemical industrialization in the 1960s, knowledge-intensive industrialization[3] in the 1970s, creative knowledge intensification[4] in the 1980s, and transformation of economic development model from production-centered to quality consumer lifestyles in the 1990s. The visions served to facilitate consensus building within the government and between government and the business sector [32, 38].

The end of Edo-Meiji was the period when Japan entered the modern era and, out of necessity, pushed ahead with modern industrialization for the sake of enriching the country and strengthening the military. Unlike post-war Japan, there were no government official documents outlining a vision for industrialization, but a vision was formed by state leaders. The industrialization efforts under the vision were a process of repeated trial and error, but the Industrial Revolution was achieved in two stages in just around 40 years after the opening of the country and its ports, first in light industry and then in heavy industry, and the establishment of modern industry was ensured.

From the perspective of the vision, the experiences in the end of the Edo-Meiji period would be more helpful for developing countries. Needless to say, the initial

[3] According to Odaka [32, p. 12], knowledge-intensive industry includes computers, industrial robots, integrated circuit, aircraft, telecommunication equipment, office equipment, numerically controlled machine tools, information processing service, software, and fashion-oriented industries (e.g., luxurious apparel and furniture, housing furnishings, audio visual devices).

[4] Odaka [32, p. 14] explains creative knowledge intensification as the vision that attempts to overcome the constraints of scarce natural resources, pursuing achievement of vitality and wellbeing simultaneously. To this end, MITI tried to realize new orientations of industrial structure to meet the four criteria, that is, dynamic comparative advantage, peoples' demand, energy-saving, and national security. This is industrial structure with an orientation of creative knowledge intensification. Biotechnology, new materials, new energy, and the fifth-generation computer were exemplified.

conditions in Japan then and in developing countries today are quite different. Meiji Japan was blessed. First, it inherited a legacy of administrative structures, better social indicators, the development of indigenous industry and its technological basis, experience of a market economy, and capital accumulation from the early modern period. Second, the homogeneity of national ethnicity was relatively high and there was no experience of specific sectors of the economy being dominated by foreigners. As a result, it was relatively easy to form a national consensus on the urgent need for and direction of industrialization. Many of today's developing countries not only lack these favorable initial conditions at the start of their attempts at industrialization, but also need to struggle for industrialization in the new context of increasing globalization, the penetration of cheap products from China and other less developed industrial countries into their domestic markets, and digitalization.

Nevertheless, it is worthwhile to summarize the Japanese case as a reference for industrialization in developing countries for the following reasons. First, the Japanese experience is a model of industrialization in a catch-up context. Second, Japan did not have a modern industrial sector until it started industrializing in the late nineteenth century. The contrast between before and after modern industrialization is relatively clear and therefore easy to analyze as a benchmark.

Based on this recognition, the remaining sections are organized as follows. Section 3.3 reviews the evolution of the industrialization vision from the end of Edo-Meiji period. Section 3.4 analyzes the process of narrowing the gap and discusses which learning factors and triggers were activated at what time and to what effect. Finally, Sect. 3.5 concludes by summarizing the implications of the Meiji Japanese experience for developing countries today.

3.3 The Experience of Meiji Japan in Vision Formulation and Learning

The end of the Edo-Meiji period in this chapter covered a period of around 30 years. The functioning of the learning factors, triggers and their impact varies from period to period. To capture them clearly, this chapter follows Oe [33] and Amatsu [3] and discusses Japan during this period by dividing it into three eras: the Ministry of Engineering (MOE) era (before Meiji to Meiji 6, 1868–1873),[5] the Ministry of Home Affairs (MOHA) era (Meiji 6 to Meiji 13, 1873–1880), and the Ministry of Agriculture and Commerce (MOAC) era (Meiji 14 to Meiji 30, 1881–1897).

[5] MOE was established in 1870 (Meiji 3); but for the sake of convenience, the MOE era also includes the end of the Edo period. The modern industrialization process started at the end of the Edo period, and the Ministry of Popular Affairs (MOPA) and the Ministry of Finance (MOF) were still in charge until the establishment of MOE. Therefore, more strictly speaking, the period should be referred to as the end of the Edo, MOPA, MOF, and MOE eras; but for the sake of simplicity, it is referred to as the MOE era. The MOHA period is defined as the period from 1873 (Meiji 6) to 1880 (Meiji 13), during which the MOE continued to exist until it was abolished in 1885 (Meiji 18).

3.3.1 Ministry of Engineering Era (1868–1873)

3.3.1.1 Industrialization Vision: Forming an Initial Version

In the end of Edo and the early Meiji period, visits to Western countries and study abroad trips had a major influence on the formation of the initial version of the industrialization vision. Among these, the trip by the Tyōsyū Five to the United Kingdom (UK) is particularly famous. At the time, Japan was in the process of transitioning from national isolation to opening up to the outside world, and a storm of anti-foreign government movements was raging. Five young men from the Tyōsyū clan—Inoue Kaoru, Ito Hirobumi, Yamao Yozo, Inoue Masaru, and Endo Kinsuke—were believers in the principle of that movement, but they felt that to realize exclusion they needed to know the other side first. So, they travelled to the UK to study naval affairs. They were surprised to find themselves that in Shanghai, where they stopped, and in London, where they arrived after a long voyage, there were many ships anchored in the harbor, brick buildings lining the streets, modern factories and smoke rising from chimneys, and steam locomotives running in the distance [27, pp. 248–261]. The difference in state power between Japan and the Western countries was astonishing, and they realized that exclusion of Western countries was not realistic, while opening Japan and its ports, and modern industrialization, were of great importance. Many Japanese who saw the Western countries during this period must have felt the same way.

On his return to Japan, Inoue Kaoru formed the Enlightenment group together with Okuma Shigenobu and others.[6] After the MOE was established in leap October 1870 (Meiji 3), he continued to play a leading role in the early policy of industrialization, the so-called *Syokusan-kōgyō*. From the outset, MOE was dominated by people who had been abroad. They are thought to have been influential in policy as possessors of Western knowledge. Inevitably, the aim was to replicate the model of Western countries [11, p. 245, 14, p. 25, 23, pp. 15–18]. The second was the establishment of new state-run factories (such as Akabane and Fukagawa Workshops). Loans were provided for industrial promotion [9, pp. 450–451]. However, such efforts during this period were not planned and were ad hoc in character [37, p. 241].

The industrialization vision that was formed can be roughly organized as follows. First, it envisaged the industrial composition which prioritizes the formation and development of those industries necessary for state building (bricks, cement, and glass), weapons and their materials necessary for a strong state (iron and steel making, shipbuilding), and major export industries (raw silk, mining industry). Secondly, it envisaged the industrializers as mainly state-run factories.[7]

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[6] Okuma Shigenobu did not experience such travel.

[7] Obata [31] argues that Inoue Kaoru and MOF put an emphasis on private-sector vitality (225–32). Harada [8, p. 129] also mentions the existence of a public interest perspective as a motive for the management of state-run model factories. However, considering that in pre-modern Japan, the private sector was engaged in the production of arts and crafts in each clan area throughout the country and commercial activities were widely conducted, it is unnatural to assume that Inoue

What the Meiji government actually did based on its vision was, first, the seizure or purchase of modern industries from the Tokugawa shogunate and clans (for example, the former were the military arsenals in Tokyo and Osaka, and shipyards in Yokosuka, Nagasaki, and Ishikawa-Jima, and the Hyogo Shipyard and Sakai Spinning Mills in the latter) [37, p. 241].

3.3.1.2 Industrialization Vision and the Reality in MOE Era

The initial version of the industrialization vision diverged significantly from the reality in several aspects. First, there was a divergence from the line-up of the real industrial sector [26]. At the time, Japan was an agricultural country and industry was mainly indigenous industry.[8] According to a prefectural survey of products conducted in 1874 (Meiji 7), alcoholic beverages and other food and beverage products, textiles and other clothing products accounted for an extremely large proportion of industrial output. Alcoholic beverages and textiles alone accounted for 32.3 % of total industrial output [39, pp. 13–16, 1, p. 295]. Secondly, there was a divergence between the industrial composition targeted by the industrialization vision and the main export and import products. According to MITI [23, p. 12], the main export products were raw silk, tea, copper, ceramics, and sea weeds, while the main import products were cotton yarn and sugar, with a high proportion of primary products in the composition between 1868 (Meiji 1) and 1880 (Meiji 13).

Third, the divergence was also observed in the establishment and operation of state-run model factories. According to Ishizuka [10, pp. 160–161], the financial performance between 1877 (Meiji 10) and 1885 (Meiji 18) of what became state-run factories in this period shows a deficit in the case of Hyogo Shipyard, Akabane Workshop, Senju Woolen Fabric Factory, and Tomioka Silk Mill.[9] The fact that this was the case during the MOHA era means that the earlier MOE era had insufficient capacity to operate modern industry. However, as Nagai [26, p. 211] argues, this chapter does not undervalue the technological contribution to the subsequent industrialization process made by state-run model factories.

The situation in individual industries also reveals the existence of a gap. In the case of cotton spinning industry, the first modern spinning factory in Japan was Kagoshima Spinning Mill, which started operations in 1867. This was followed by the Sakai Spinning Mill and the private Kashima Spinning Mill. The Kagoshima Spinning Mill was operated with the assistance of British engineers from Platt Brothers Co. Ltd, but after their withdrawal it was unable to operate technically and it consistently

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Kaoru, Okuma Shigenobu, and others were of the opinion that industrialization could be achieved solely through state initiatives, even though the times had changed in the Meiji period.

[8] According to Arisawa [6], based on a survey by the Ministry of Agriculture's Bureau of Engineering in 1909, *Administration of the Bureau of Engineering and its Policies*, indigenous industries included silk textiles, cotton textiles, sake brewing, zariyuki yarn making, Japanese paper, ceramics, lacquerware, cloisonne, flower mats, sanada (straw mats), and various other industries.

[9] Both the Hyogo Shipyard and the Akabane Workshop were founded by their predecessors in 1871 (Meiji 4) and renamed in 1877 (Meiji 10).

underperformed [16, pp. 38, 115–140]. These three initial spinning operations did not lead to the subsequent rise of the spinning industry and 'remained an episode that decorated the prehistory' [6, p. 32]. In the case of the silk reeling industry, exports to Europe had already increased rapidly in the end of the Edo period, but the rapid expansion of production created serious quality problems. The Tomioka Silk Mill was planned under the then Ministry of Popular Affairs in 1870 (Meiji 3) to standardize and improve quality through the introduction of machine-made silk, but it did not actually start operating until 1872 (Meiji 5). As for heavy industry, the iron and steel industry was only established in 1873 (Meiji 6) when the Kamaishi Branch Office was established under MOE; so it cannot be said that there was anything worth seeing at this time. In military-related industries, the military arsenals played an important role in terms of technology formation, but as they cannot be discussed in the same breath as other industries, this chapter will not go into depth in discussing their contribution.

The fact that modern industrialization was at a very early stage can be seen from the exhibits at the World Expositions and national expositions. The main exhibits were raw silk, minerals, flora and fauna, arts and crafts; there were no modern industrial products [20].

Against this backdrop, the era of MOE came to an end. What prompted the transition to the next era was the resignation of Inoue Kaoru, who had been the driving force behind the early industrialization efforts. Also, the Iwakura Mission, which was dispatched at the end of the MOE era, marked a turning point in the correction of the industrialization vision for the next era. The Mission was sent for one year and nine months between 1871 (Meiji 4) and 1873 (Meiji 6), and involved a total of 108 people including 46 government officials.[10] According to the Mission records compiled by Kume Kunitake in 1878 (Meiji 11), during their visit to Western countries, the state leaders observed systems of state governance, economic management, industrial production, and education, and learnt that behind Western military power there existed a modern state and economic power driven by modern industry. They also formed an image of future Japanese state building and modern industrialization. At the same time, they finished their visit with the impression that 50 years had just passed since the Industrial Revolution began in the UK and 30–40 years since Prussia and Russia achieved industrialization and that it was by no means impossible for Japan to do the same.

[10] Some authors, such as Katsuda [15], gives the official members of the Mission as 48 and the number of accompanying persons as 54.

3.3.2 Ministry of Home Affairs Era (1873–1880)

3.3.2.1 How Was the Industrialization Vision Corrected?

Industrialization during the Home Ministry era was led by Okubo Toshimichi, who had joined the Iwakura Mission and learned what the wealthy and powerful in Britain had done [15, p. 49].When MOHA was established in 1873 (Meiji 6) after his return to Japan, Okubo was appointed Home Minister. Thereafter, he took the lead in the industrialization efforts of the country. He wrote a 'Proposal for Industrialization' (*Syokusan-kōgyō ni kansuru kengisyo*) in 1874 (Meiji 7), a 'Proposal for Determining the Terms of Reference of the Ministry' (*Honsyō zigyō no mokuteki wo sadamuru no gi*) in 1875 (Meiji 8), a 'Proposal on Nurturing the State Economic Power' (*Kokuhon baiyō ni kansuru kengisyo*), and a 'Proposal for the Public Administration Reform' (*Gyōsei kaikaku no kenpakusyo*) in 1876 (Meiji 9), and thus presented his vision for industrialization.

3.3.2.2 Revised Industrialization Vision

In Okubo's eyes, the situation in Japan at the time of 1874 (Meiji 7) was that the shape of the state and the institutions concerning the people's lives were gradually being put in place, but that with regard to industrialization, the results of efforts were not visible. The people's knowledge was not sufficiently open, and they were unable to respond to changing circumstances. As the people's temperament was frail, the government considered it necessary to actively guide them towards industrialization.[11] For in his eyes, even in 1876 (Meiji 9), the people's knowledge was still insufficient, private industry had not yet been promoted, domestic production had not increased, resulting in a continuing trade deficit, and the industries that had existed before modernization were beginning to decline.[12] There was also a reflection that industrialization during the MOE era was superficial [26, p. 180]. Given that other state leaders and policymakers expressed similar views, Okubo's views were average for the period.

The major differences between the revised industrialization vision and that of MOE were, firstly, that the direction of industrialization followed the previous path, but with an emphasis on a decrease in imports and an increase in exports. As a result, in terms of the industrial composition, emphasis was placed on the promotion of indigenous industries, which had previously been the main products in terms of exports but had been largely ignored. Secondly, and related to the first change, there was an increased emphasis on the encouragement of industrial activities led by the private sector [5, p. 95]. The reality was that the state-run model factories still played

[11] A Proposal for Industrialization written by Okubo Toshimichi in 1874 (Meiji 7).

[12] A Proposal for Determining the Terms of Reference of the Ministry of 1875 (Meiji 8), and A Proposal on Nurturing the State Economic Power of 1876 (Meiji 9).

a central role, but the addition to the vision was nevertheless significant. As for the government's stance, it remained as paternalistic as it had been during the MOE era.

Looking at the measures taken during the MOHA era, firstly, the operation of state-run factories from the time of MOE continued. Secondly, new state-run factories were established. These were the Shinagawa Glass Works (established in 1876, Meiji 9), the Shinmachi Waste Thread Factory (established in 1877, Meiji 10), and the Senju Woolen Fabric Factory (started operation in 1879, Meiji 12). Thirdly, government funds were allocated for industrial development programs led by prefectures. In terms of individual industries, in the cotton spinning industry, around 1877, the 2,000 Spindle Plan was promoted to prevent imports, and the Aichi and Hiroshima Spinning Mills were newly established under government management (however, the Hiroshima Spinning Mill was sold to the private sector before completion). 10 units of spinning machinery with 2,000 spindles were purchased with government funds and sold to private industrial entrepreneurs. Replacement payments were then made to them for the purchase of imported spinning [23]. For heavy industry, MOE established the Kamaishi Branch Office, which inherited facilities from the end of the Edo period. As for indigenous industry, it seems that measures were not actually implemented at the central level until around 1885 (Meiji 18) [6, 26, 28].

3.3.2.3 Revised Industrialization Vision and the Reality

It can be seen that the industrialization vision of the MOHA era also diverged from the actual situation in the industrial sector. First, the main export and import products were still mainly primary products, as was the case in the MOE era. Second, as already mentioned, the financial performance of state-run factories continued to be in deficit. Nevertheless, the number of silk mills that received technical guidance from the Tomioka Silk Mill amounted to 17 from 1874 (Meiji 7) to 1877 (Meiji 10), and the number of apprentice female workers accepted from various prefectures totaled 3,238 from 1874 (Meiji 7) to 1884 (Meiji 17) [35, pp. 253–254). Third, there was the failure of the state-led industrialization programs and projects such as the cotton spinning and iron and steel industries. Take the example of the 2,000 Spindle Plan. According to a cotton manufacturer:

> Our factories in various parts of the country were poorly capitalized, lacking in academia, and with the ill will to import 7 million yen of cotton yarn every year, we were so-called daredevil and patriotic, and at the time we left it to the government's guidance and plotted a grand task without measuring ourselves, and to this day, we have hardly advanced or retreated from it. Today, they are almost always in a state of retreat. [6, p. 35][13]

This reveals that there was a lack of understanding of the spinning industry among the government and manufacturers. In the iron and steel industry, a blast furnace was constructed in Kamaishi in 1880 (Meiji 13). It began operating in the same year, but a fire accident at the charcoal plant led to its shutdown within a short period of time.

[13] Originally published in Cotton Yarn *Syudankai* article, 1885 (Meiji 18).

It was not put into operation again, and Kamaishi was temporarily closed down in 1882 (Meiji 15).

The gap between the ideals and reality of the industrialization vision can be also observed in the exhibits at World Expositions and national industrial expositions. At the Philadelphia World Fair (1876, Meiji 9), the majority of exhibits were ceramics and other indigenous industrial products, while at the First National Industrial Exhibition (1877, Meiji 10), although the government positioned it as an industrial promotion event, only coal lumps dug out with a new type of machine and a *Garabō* (spinning machine) by Gaun Tacchi were exhibited. Other than that, there were many arts and crafts [20].

In response to this situation, Nagai [26, p. 210] described the state-run model factories during the Home Ministry era as a failure. The MOHA era came to an end with the assassination of Okubo Toshimichi in 1878 (Meiji 11). On the other hand, the period of MOHA was also a time of gradual change in the views of state leaders regarding the main actors of industrialization. It is true that the actual policy was state led with its model factories. However, when drawing up plans for the establishment of the Senju Woolen Fabric Factory, Okubo himself stated that the mill must be paid for by the private sector someday, therefore, the factory equipment and other costs should be spent, and that if possible, it should be designed to be simple as a facility, mainly for refining, so that there will be no obstacles to its further expansion by being transferred to the private sector later. It can be seen that Okubo assumed that the private sector would eventually take the lead in industrialization. Furthermore, in a 'Proposal for the Change of the Economic Policy' (*Keizai seisaku no henkō ni tuite*) written by Okuma Shigenobu in 1880 (Meiji 13), it was argued that state-run factories should be disposed of,[14] and in a 'Paper on the Fiscal Outlook' (*Zaisei kanki gairyaku*) written by Matsukata Masayoshi in the same year, the opinion was presented that what could be left to the private sector should be left to them. These led to the promulgation of a regulation for a Disposal of the State-run Factories (*Kōzyō haraisage gaisoku*) in 1880 (Meiji 13). However, the conditions for companies to pay down their factories were too strict, and no such disposal was made. In 1884 (Meiji 17), the regulation was repealed. However, there is no doubt that the idea of private sector-led industrialization became the default for state leaders and policymakers.

[14] According to a Proposal for Change of the Economic Policy written by Okuma Shigenobu in 1880 (Meiji 13), state-run factories were classified into three categories: (i) those which, due to the nature of the business, needed to be handled by the state (e.g., military and infrastructure-related); (ii) those which required advanced knowledge and were better handled by the state in terms of maintaining confidentiality (coin minting and note printing); and (iii) those which should have the private sector in charge, but as the private sector has not grown up, the state has been operating on a pilot basis.

3.3.3 Ministry of Agriculture and Commerce Era (1881–1897)

In 1881 (Meiji 14), the Ministry of Agriculture and Commerce (MOAC) was established, combining the industrialization policy functions of MOE and MOHA. At that time, no document was issued like the Proposal for Industrialization written by Okubo after assuming the post of Home Minister. From this comes the view that a new stage began at this time, departing from the initial stage of state-led industrialization [26, p. 202].

3.3.3.1 Industrialization Vision in the MOAC Era

It is believed that the vision remained virtually unchanged in terms of the industrial composition even after the MOAC era. Documents and records submitted by those active during the transitional period from MOHA to MOAC and after the beginning of the MOAC era show that they advocated the need to improve the trade balance and promote domestic industry but did not mention the future state of its industrial composition. This may be because there was de facto consensus on the need to form the industries necessary for building a modern state and enriching the country and strengthening the military, same as in the previous eras. However, several other changes could have been made. Firstly, the expected main actors of industrialization shifted from the state-run factories to the private sector. After a regulation for a disposal of the state-run factories was repealed in 1884 (Meiji 17), three successive rounds of actual disposal followed [17]. Second, the government's stance on industrialization shifted from direct to more indirect one. In 1880 (Meiji 13), Ito Hirobumi and Okuma Shigenobu jointly submitted a Proposal for the Establishment of MOAC, which critically stated that, under the policy of encouraging agriculture, commerce, and industry, the government has established state-run factories and interfered with private businesses by lending funds and creating model businesses, but they have unwittingly created competition with private business, thereby undermining their profits. Reflecting this view of state leaders, during the era of MOAC indirect methods were adopted, such as the recommendation to hold *Kyōsinkai*[15] and agricultural trade fairs, and the development of technological administration and patent systems, rather than the establishment of state-run model factories. Around 1885 (Meiji 18), support for indigenous industry was also provided.

[15] *Kyōsinkai* was a product-specific fair, which Matsukata Masayoshi learnt about at the occasion of his visit to the Paris World Fair in 1878 (Meiji 11). It was promptly introduced as a result of his recommendations after his return to Japan.

3.3.3.2 Revised Industrialization Vision and the Reality

The gap may be considered to have narrowed significantly during the MOAC era—especially in the middle of the Meiji period. This is also the result of the industrialization vision coming closer to the reality on the government side. First of all, it can be seen that the formation of the vision was not based on euphoria about how it should be, but on the reality. This can be confirmed through the statements of state leaders of the time. In his opening speech at the First High-level Meeting of the Agriculture, Commerce, and Industry in 1896 (Meiji 29), Vice-Minister of Agriculture and Commerce Kaneko Kentaro stated that while Japan had reached the stage of becoming an industrial nation, trade promotion was important and that Japan should export to Western countries raw silk, tea, and arts and crafts which were its own products and export its manufactured products to less developed Asian countries. The importance of improving quality was emphasized. There was no longer any idea of forcibly forming industries that did not exist in Japan as a matter of policy, but rather the logic of the direction of future industrialization was built on the basis of reality [24, pp. 16–26]. And as for the main actors of industrialization, the private sector became more important, both in name and in reality.

The narrowing of the gap is also the result of the development of the private sector side. The experience of two periods of the boom of private company establishment in the Meiji period led to progress in catching up with the direction and states set by the industrialization vision. In the cotton spinning industry, the success of the Osaka Cotton Spinning Company (Osaka Boseki), founded in 1882 (Meiji 15), saw the emergence of a movement to follow suit. According to MITI [23, p. 197], the size and production of spinning mills expanded rapidly after 1889 and 1890 (Meiji 22 and 23), for example, 76 (1887, Meiji 20), 215 (1889, Meiji 22), 353 (1891, Meiji 24), 381 (1893, Meiji 26), 580 (1895, Meiji 28), and 970 (1897, Meiji 30) in terms of number of spindles (unit: 1,000 pieces),and 23 (1887, Meiji 20), 67 (1889, Meiji 22), 144 (1891, Meiji 24), 214 (1893, Meiji 26), 366 (1895, Meiji 28), and 511 (1897, Meiji 30) in the volume of domestic production (unit: 1,000 pieces), while the volume of imports declined after the peak in 1889 (Meiji 22).

These developments brought about the first boom in company establishment, with a rapid increase in the establishment of private companies in other industries as well. In the silk reeling industry, the number of silk mills in the Suwa region reached the height of their prosperity in 1893 (Meiji 26). In the cotton textile industry, a hybrid business of cotton spinning and weaving emerged in 1888 (Meiji 21), and in 1889 (Meiji 22) the Osaka Boseki started cotton weaving on power looms. In the iron and steel industry, Tanaka Chobei took over the abandoned Kamaishi Mine in 1885 (Meiji 18) and established the Kamaishi Mine Tanaka Steel Works in 1886 (Meiji 19). In 1894 (Meiji 27), the company succeeded in making pig iron for the first time using domestically produced coke. In shipbuilding, Kawasaki Shozo added a shipyard in Hyogo in 1881 (Meiji 14). In 1887 (Meiji 20), Kawasaki and Mitsubishi took over the Hyogo Shipyard and Nagasaki Shipyard, respectively [6, pp. 72–77]. This boom was supported by the achievement of stability in the currency, the development of modern financial system, capital accumulation in the private sector, cheap labor,

a stimulus to motivation of company establishment due to good performance of existing companies, development of infrastructure (railways, marine transportation, postal service, roads, ports), development of a legal framework (bill of exchange, promissory note, trade mark, patent, etc.) [8, pp. 260–261].

As a result, the trade balance turned into surplus in 1882 (Meiji 15), and the target of decreasing imports and increasing exports was achieved. According to Yamazawa [40, pp. 248–249], in the case of cotton yarns, the situation in the Meiji period was such that imports were used to supplement domestic production that could not meet domestic demand. Later in the 1880s, while domestic demand rose sharply, domestic production also increased rapidly for example, 11,933 (1886, Meiji 19), 16,849 (1887, Meiji 20), 21,937 (1888, Meiji 21), 43,699 (1889, Meiji 22), and 64,242 (1890, Meiji 23) in terms of 1,000 Japanese yen. It began to surpass imports in 1889 (Meiji 22), and moved into a phase of declining imports around that time, for example, 19,366 (1886, Meiji 19), 26,144 (1887, Meiji 20), 37,258 (1888, Meiji 21), 33,683 (1889, Meiji 22), and 25,098 (1890, Meiji 23) in imports (unit: 1,000 Japanese yen). Cotton fabrics achieved an expansion of domestic demand and production in the mid to late 1880s, for example, 27,549 (1885, Meiji 18), 34,004 (1886, Meiji 19), 53,424 (1887, Meiji 20), 66,056 (1888, Meiji 21), and 74,494 (1889, Meiji 22) in domestic production and 42,716 (1885, Meiji 18), 46,184 (1886, Meiji 19), 71,918 (1887, Meiji 20), 86,314 (1888, Meiji 21), and 95,574 (1889, Meiji 22) in domestic demand (unit: 1,000 Japanese yen) [40, pp. 248–249].

The progress of the private sector in catching up with the industrialization vision can be seen in the exhibits at the World Exposition and the national industrial expositions. At the Third National Industrial Exhibition in 1890 (Meiji 23), shoes, machine-made silk, and copper products using Western technology were exhibited. At the Fourth National Industrial Exhibition in 1895 (Meiji 28), many electric machines were exhibited [20]. Then, less emphasis was placed on exhibiting at foreign expositions such as the World Exposition, and the Meiji government stopped participating in the World Exposition after Chicago in 1893 (Meiji 26) [23, p. 246]. According to MITI [23], by the late Meiji period (1901–1912), the government no longer referred to the word of *Syokusan-kōgyō* (456). This suggests that the gap had narrowed significantly.

During the eras of MOE and MOHA, state leaders played a central role in shaping the industrialization vision. And it was a time when their visions influenced private sector entrepreneurs. In contrast, such period came to an end in the MOAC era, when the competence of the private sector caught up with the status pursued in the vision, marking the beginning of an era in which the reality of the industrial sector influenced the formation of visions.

3.3.4 Comparison of the Three Eras

The transition of the industrialization vision can be summarized as in Table 3.1. For avoiding duplication, three points are highlighted here. First, the vision tended to be formulated based on the euphoria of state leaders, not the actual situation of the industrial sector initially. Then it came to be formulated based on the reality but experiencing a transition period of a hybrid of euphoria and reality-based vision formulation. As industrialization progressed, this gap was narrowed. Interestingly, the desired industrial composition did not appear to be changed dramatically, rather almost maintained through the three eras. Instead, the expected main actors of industrialization were changed along with the change of the intervention style by the government, shifting from a direct or paternalistic approach to a more indirect one.

3.4 Analysis of the Learning Process

We have reviewed the evolution of the industrialization vision and the process of narrowing the gap in three separate eras. What would be of interest today for latecomers is what learning factors and triggers worked in Japan, at what time, and what results were achieved in the early stages of industrialization.

Table 3.1 Evolution of the Industrialization Vision in the MOE, MOHA, and MOAC Eras

	MOE era (1868–1873)	MOHA era (1873–1880)	MOAC era (1881–1897)
Basis of vision formulation	Euphoria-based	Euphoria and reality-based	Reality-based
Gap	Large	Being reduced	Reduced more
Desired industrial composition	Development of those industries necessary for state building (bricks, cement, and glass), weapons and their materials necessary for a strong state (iron and steel making, shipbuilding), and major export industries (raw silk, mining industry)	Same as the left and indigenous industries	Same as the left
Main actors	State-run factories	Private sector, but substantially state-run factories	Private sector
Government stance and policy actions	Direct intervention through simple copy & paste	Direct intervention	Indirect intervention

Source Author

3.4.1 Learning Factors

To pass this information, we focus on several learning factors. The first factor was the intense interest and seriousness of state leaders and policymakers towards modern industrialization. In the case of Japan at the end of Edo-Meiji period, state leaders and policymakers did not have a background in modern industry. However, they were extremely serious about industrialization. This became the lead-off factor in the subsequent state learning process. State leaders and policymakers, including the Tyōsyū Five and the Iwakura Mission, went to the West and studied the systems in place there as stated previously. According to Ishizuki [11], 152 people studied in the United States, UK, France, the Netherlands, and other countries at the end of the Edo period, and 586 from 1868 (Meiji 1) to 1874 (Meiji 7) (141–42, 204). In addition, records were diligently taken at the Iwakura Mission [18] and others. These visits nurtured the passion for industrialization. According to Watanabe Kunitake, Okubo's life as a leader can be divided into two periods. The first was the period of building a unified modern state centered on the Meiji Emperor, and the second was the period after his return from the Iwakura Mission, when he worked diligently on *Syokusan-kōgyō* [15, pp. 805–806]. Trips to Western countries and study abroad were all financed with funds accumulated in the country. What would we call this situation without acknowledging that they were highly serious?

The second learning factor was the accumulation of industrial knowledge and skills within the government, in particular the formation of a pool of engineering technocrats. State leaders and policymakers in the Meiji period were keen to absorb and accumulate knowledge internally. As a result, it is thought that this led to the creation of a foundation for a deeper understanding of modern industry. According to the author's personal experience abroad, in developing countries in the early stages of industrialization, the private sector often complains that even if they want to discuss with a government, they cannot speak in a common language due to the lack of accumulated knowledge within the government, such as in a Ministry of Industry.

Recalling this, the efforts of Meiji Japan would have been important. Short-term efforts included, firstly, experiencing the manufacturing systems that Amsden [4] emphasized. At the end of the Edo period, the Satsuma and Saga clans actually built reverberatory furnaces and ships based on foreign language literature. In the case of the Satsuma clan, Godai Tomoatsu was ordered to buy spinning machinery. In the Meiji period, as already mentioned, the government led the construction and operation of state-run factories and supported the design of modern factory construction and the installation of modern machinery for private industrial entrepreneurs. For example, in the 2,000 Spindle Plan, Ishikawa Seiryu, who had been involved in the Kagoshima Spinning Mill, designed the mill and provided operational guidance for them, while the Akabane Workshop designed a prototype spinning machine at its request.

While the 2,000 Spindle Plan failed as a result of the exclusion of hired foreigners from the Plan because the government was concerned about starting up the Plan with only Japanese engineers [30, p. 201], it was hardly possible that experiencing

manufacturing did not contribute to an accumulation of a sense of industries within the government. Secondly, the opportunity of the World Exposition was utilized. At the Vienna World's Fair held in 1873 (Meiji 6), 28 government officials were among the 77 dispatched, and seven of the 28 were technical apprentices. These included those with experience in setting up and running operations in machine production of silk reeling mills, chemical, machinery, and shipbuilding factories [7, pp. 59–66].

In the medium to long term, the knowledge accumulation progressed within the government through the creation of its own system for producing engineering technocrats at the Engineering Institution, which was established in 1871 (Meiji 4) and later renamed as the Imperial College of Engineering. According to a Regulation on the Organization and its Management of the Engineering Institution revised in 1874 (Meiji 7), the Institution was under the jurisdiction of MOE and was a school for educating future engineering technocrats serving in MOE, and this policy was also inherited by the Imperial College of Engineering [21].

On the other hand, it would be premature to assume that the birth of the engineering technocrats and the internal accumulation of industrial knowledge and skills were the immediate result of the study abroad programs and the establishment of the Imperial College of Engineering. Firstly, according to Ishizuki [11], study abroad in the Meiji period can be divided into three: the first period (1868–1876, Meiji 1 to Meiji 9), the second period (from 1875, Meiji 8), and the third period (from 1882, Meiji 15). In the first period, the level of education received in study-abroad destinations was not specialized education, and the overwhelming majority of students were enrolled in secondary education or lower. Inevitably, the academic ability of those students who returned home was insufficient and the program was not effective. In the second period, study abroad to deepen specialization began to take place, but it was not until the mid-1890s that they returned home and began to play an active role in the real world [11, pp. 239–249, 271–277, 310].

With regard to the Imperial College of Engineering, the first 23 students of the College, including those enrolled in the Engineering Institutions, graduated from the College in 1879 (Meiji 12). Looking at the career paths of the graduates in the old Engineering College data (1931), it was around 1883 (Meiji 16) or 1884 (Meiji 17) that the first graduating class became professors at the Engineering College or engaged in business in the real world, after studying in the UK and other countries. A few joined MOAC as engineering technocrats [13, p. 68]. Nakaoka [29] argues that it was around 1892 (Meiji 25) that the graduates of the Imperial College returned to Japan from study abroad and their activities became prominent in the steel industry (28, 41). Thus there is inevitably a time lag between the start of efforts to accumulate industrial knowledge and skills and the actual formation of the pool of engineering technocrats. The year 1896 (Meiji 29), when Kaneko Kentaro delivered his speech relating to his view on industrialization in the First High-level Meeting of the Agriculture, Commerce, and Industry, may be interpreted as such a time.

The third learning factor is the high sensitivity of state leaders and policymakers to the error correction factor, which tells state leaders of the need and urgency to correct the course of their industrialization vision. Generally, the larger the gap, the more the error correction factor will be activated. This was the case in Meiji Japan

too. The first important error correction factor was the macroeconomic situation of budget deficits and trade imbalances [26, pp. 180–182]. The budget deficit problem existed in the background to the resignation of Inoue Kaoru and the end of his time at MOE. The same was the background to the addition of decrease in import and increase in export as one of the goals of industrialization during the Home Ministry era. As evidence of this, documents left behind by state leaders at the time frequently discussed these two imbalances. The fiscal deficit and trade balance problems had become so serious that even Okubo, a proponent of *Syokusan-kōgyō*, had no choice but to submit a Proposal for Public Administration Reform in 1876 (Meiji 9). This was also the problem that led to Okuma Shigenobu's Proposal for the Change of the Economic Policy and Matsukata Masayoshi's Paper on the Fiscal Outlook in 1880 (Meiji 13), which argued for the withdrawal of the government from its factories.

The second error correction factor is exposure to the market. The holding of World Expositions, national industrial expositions and *Kyōsinkai* made Meiji Japan aware of the quality and competitive position of its own technology and products in the international market [7, p. 28]. According to Kuni [19], the Meiji government was not aware of where and what industries existed in Japan when promoting its policy of industrialization and development. For this reason, it industrialized the national industrial expositions to grasp the actual situation of indigenous industries (176–78). Okubo himself, in the First National Industrial Exhibition, stated that:

> Generally speaking, our crafts are not exempt from these three diseases, and there is no end to the number of things that should be exported overseas but are not doing so well at present. We shall investigate in detail the quantity and quality of the various types of products, and the quality of the workmanship of the man-made products. We shall change what should be changed, count what should be counted, supplement the small to make the large, change the poor to make the good, and create the future benefits. [15, p. 521–23]

In one sense, this was an emphasis on friendly competition between producers, but it would also have forced the state leaders to see the difference between the future state laid out in their industrialization vision and the actual situation of the industrial sector.

A third factor to notice is the diversity of debates within the government. Although the Meiji period sometimes tends to be associated with an authoritarian image, it was also a time when a variety of debates were accepted. Even during the MOE and MOHA eras, arguments were made that did not necessarily coincide with the government's industrialization line at the time.

3.4.2 Triggers

Triggers that facilitated the learning process also played an important role. It is believed that this increased the effectiveness of the learning factors mentioned above and accelerated the pace of gap reduction. The first trigger was the fact that Meiji Japan was facing a crisis of state survival. It was exposed to military threats from Western countries, such as the Opium War in China, the Shimonoseki War, and

the Anglo-Satsuma War [36, p. 42, 8, pp. 10–13]. When the Iwakura Mission met Chancellor Bismarck in Prussia, they were advised that the Western powers would respect international law when it was in their interests but would resort to military means when it was to their detriment, and that in such circumstances, small countries had no choice but to promote their state power to be able to negotiate on an equal footing with the major powers [15, p. 52]. These factors led to the formation of a national consensus to promote modern industrialization and realize the policy of enriching the country and strengthening the military.

A second trigger was the presence of vigorous private industrial entrepreneurs. As they continued to formulate technologies, their emergence led to the recognition of their existence as a main actor for industrialization among state leaders and policy-makers. However, their presence as a trigger did not perform strongly from the early stages at the end of Edo-Meiji period. Harada [8, p. 267] argues that they gradually increased their presence and began to perform as triggers in the mid-Meiji period. This can be seen by tracing the evolution of the presence of private companies in each of the three time periods in this chapter. Some descriptions are duplicated with the previous parts, but we would trace them one by one in this context.

First, looking at the MOE era, there were the first three spinning mills in the cotton spinning industry, but this did not lead to the subsequent development of a modern spinning industry [6, p. 32]. In the case of the silk reeling industry, the Meiji government actually established the Tomioka Silk Mill in 1872 (Meiji 5). During the MOE era, the main export products and exhibits at the World Expositions were those of indigenous industries, and their presence was probably not sufficient to be recognized as a main actor in industrialization by state leaders.

During his time at MOHA, Okubo stated in a Proposal for Industrialization in 1874 (Meiji 7) that 'the people's power is still weak and their spirit is still weak…' Even in the discussions on the establishment of the Shinmachi Waste Thread Factory and the Senju Woolen Fabric Factory, it is difficult to say that he paid much attention to private industrial entrepreneurs. And this is not to mention the failure of the 2,000 Spindle Plan. However, it is also true that in this period, the growth of private industrial entrepreneurs as a main actor of industrialization came to be recognized, such as the discovery of local entrepreneurs by Okubo Toshimichi during his Tohoku visit in 1876 (Meiji 9). Around 1877 (Meiji 10), small machine silk reeling mills sprang up in various parts of the country under the influence of the Tomioka Silk Mill [6]. In terms of technological formation, the *Garabō* (spinning machine) was invented by Gaun Tacchi in 1877 (Meiji 10). Therefore, although the presence of private companies was not significant, it can be said that this was the period when they gradually started to operate as a trigger. It is believed that by the beginning of the MOAC era, the presence of private industrial entrepreneurs had grown sufficiently to make the government take notice.[16] As already noted, their activities increased in various industries. It is difficult to believe that the Meiji government at the time was still unaware of their potential as a main actor in industrialization.

[16] The Ministry of Trade and Industry [23, p. 192] expressed a similar view.

A third trigger was the active expression of diverse opinions outside the government. As an example, from 1879 (Meiji 12) to 1880 (Meiji 13), Taguchi Ukichi, an economic journalist, argued in the Tokyo Economic Journal that economic activities should be left to the private sector. Later, as mentioned above, in 1880 (Meiji 13), Okuma Shigenobu and Matsukata Masayoshi submitted proposals advocating the reduction of the state intervention in industrialization. Although it is difficult to prove a causal relationship between the two, it is quite possible that these growing voices outside the government also had some impact on the formation of the state leaders' vision [25, pp. 73–76].

3.5 Conclusions: Implications for Today's Developing Countries

The vision of industrialization formed by state leaders in the early stages will inevitably diverge from the actual situation in the industrial sector, as long as the vision is a vision. Gap reduction is the state learning process itself, and it is important to know at what point in the early stages of industrialization the learning factors and triggers, which are factors inside and outside the government, performed, and consequently at what point in time gap reduction is achieved. This chapter has examined the gap reduction process based on the experience of Meiji Japan. As a result, several points deserve special emphasis.[17]

First, the intense interest and seriousness of state leaders and policymakers are important. According to the experience of Meiji Japan, the industrialization vision is created based on euphoria of state leaders and policymakers initially. The second important point is the extent to which industrialization knowledge can be accumulated within the government. Such internal accumulation will lead to a deeper understanding of industrialization and industries among state leaders, and to the development of a more realistic vision.

Third, it is important not to overreach and cause economic collapse during the gestation period from the initiation of the government's learning process to its progress. The more ambitious the industrialization vision, the more the error correction factor tells state leaders and policymakers of the need and urgency to change the course of the vision. It is important that the level of their sensitivity to these signals is high. If the sensitivity is high, the vision will be corrected. However, if the sensitivity is not high, macroeconomic collapse will force industrialization to change course. The result will be a serious impact on the subsequent industrialization process, i.e., a prolonged stagnation of industrialization. It would be nice if economic rationality could operate as a decision-making measure to force state leaders to alter the course of their vision, but this is unlikely to be the case in the early stages of industrialization.

[17] This chapter mainly argues the importance of the efforts by the central government. Needless to say, it is important to cover industrialization efforts at prefectural and local level to be able to grasp the process involved in narrowing a gap more comprehensively.

Fourth, the learning process required to narrow the gap cannot progress solely through internal government efforts. By increasing the technological formation capacity of private industrial entrepreneurs and increasing their presence in the industrialization process, the government will turn their face to them as the main actor of industrialization. As industrialization progresses, the vision of state leaders and policymakers will be influenced by the reality of the industrial sector to shape their vision. For this reason, it is necessary to develop the private sector from the early stages of industrialization.

And, as Wada [38] argues, although not mentioned in this chapter, there is a particular environment that is necessary for the industrialization vision to play its role productively. It is important that private industrial entrepreneurs face the direction of the government. The vision cannot function effectively in a situation where private industrial entrepreneurs do not desperately need the government. In the case of Japan, modern industry was unknown to the private sector from the end of Edo-Meiji period up to the time of the first rise in company establishments. In addition, private industrial entrepreneurs had not built up sufficient power, both technologically and financially, to be able to play the role of industrializers. It was therefore a time when they needed the indication of future direction by the vision of state leaders.

The points highlighted in this chapter should not be seen as lessons solely limited to manufacturing-led industrialization. They are the very essence of the government's approach to industrial development and can be applied commonly whether the lead sector of economic development is agro-processing or digital innovation. On the other hand, it is not easy for developing countries in the early stages of industrialization to meet these requirements. How to proceed with industrialization without their fulfilment, or whether industrialization can proceed successfully even if these requirements are unfulfilled, is a future research agenda.

The experiences of Meiji Japan give useful insights to today's developing countries. At the same time, it also teaches us that state learning cannot be achieved by simply borrowing the model used in other countries and requires trial and error. The intensity of the interest and seriousness toward industrialization must be tested and that cannot be gifted by others in the learning process. According to Johnson [12, p. 326], 'the institutions of the Japanese developmental state are the products of Japanese innovation and experience. This suggests that other nations seeking to emulate Japan's achievement might be better advised to fabricate the institutions of their own development states from local materials.' Even today, these words never fade away.

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