



The Impact of Low Fertility in East Asia: A Case Study of Low Fertility Crisis Management in Japan

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Authors' contributions

This work was carried out in collaboration among all authors. Author CJL designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HMC and CJH managed the analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Low fertility has become a common problem all over the world. It is the same in East Asia. Japan is the first developed country in East Asia and the first country in East Asia to face the problem of low fertility. The purpose of this paper is to explore how to solve the problem of low fertility in East Asian countries. The solution may be in the case of Japan. In terms of research methods, this paper adopts case analysis and literature analysis.

The case analysis of Japan aims to explore the management plans and proposed strategies in the aspects of education faced with declining birth rate and aging industries from the perspective of sustainable development. Population issues are often the root of problems in a country, and any problems related to population will result in a crisis of social stability. Therefore, both China's One-

child policy (population control) and Japan's declining birth rate and aging response strategies (labor shortage) can be considered cases of crisis management.

In conclusion, although low fertility is inevitable, if Japan faces and deals with it step by step, it can reduce the impact of low fertility. The premise is to plan ahead and go through a period of time. In the case of Japan, it took at least 20 years to deal with the problem. And now it is still going on.

Keywords: Japan; education under declining birth rate; aging industries; labor shortage; crisis management.

1. INTRODUCTION

In East Asian countries, the problem of declining birth rate has become a serious one. In 2019, Taiwan has been the lowest fertility rate in the world. According to the world population review, which is headquartered in walnut City, California, U.S.A., the ranking of birth rate of all countries and regions in the world in 2019 is released. Among the 200 countries and regions in the world, Taiwan¹, with an average of 1.218 babies per woman. Singapore (1.26), South Korea (1.32), Hong Kong (1.32), Macau (1.34), and China (1.63) also face this problem. China even cancelled the one child policy implemented for many years in 2015².

In the population review, Japan's fertility rate is 1.478, ranked 179th out of the 200 countries. In fact, Japan is the first country in Asia to face the problem of low fertility. The purpose of this paper will demonstrate Japan's low fertility policy as a reference for East Asian countries are facing this problem [1-4].

In Japan, low fertility mainly impacts on two aspects. Education and Industries. This paper will also discuss these two aspects. In addition, the research methods used in this paper are case analysis and literature analysis.

¹At present, The authors of this paper are teaching in China, but in Taiwan, where we came from, which is facing serious problems of declining birth rate. This phenomenon has also become our motivation for writing this article.

²Before 2015, family planning in China was dominated by the One-child policy. Families with only one girl in rural areas, or of which at least one was the only child, or in the autonomous regions and some ethnic minorities (except Zhuang and Man) may have two children. In recent years, the structural problems of the Chinese population have become more prominent. The total fertility rate is close to the lowest level in the world, the aging phenomenon is serious, and the gender ratio of children is extremely high. From October 26 to 29, 2015, the Central Committee of the Communist Party of China announced a comprehensive Two-child policy at the Fifth Plenary Session of the 18th Central Committee. The One-child policy, which had been implemented in mainland China was officially over. ([https://zh.wikipedia.org/Zh-tw/Plan of Family Planning in the People's Republic of China](https://zh.wikipedia.org/Zh-tw/Plan_of_Family_Planning_in_the_People's_Republic_of_China), retrieved on September 16, 2019).

2. BACKGROUND OF LOW FERTILITY IN JAPAN

According to a 2017 Declining Birthrate White Paper of the Cabinet Office of Japan, the number of newborns in Japan's first baby boom was about 2.7 million; the number of newborns in the second baby boom was about 2.1 million, which fell below 2 million in 1975 for the first time, and then, continued to decrease every year³. The number of newborns in 2015 was 1,005,677⁴. In terms of birth rate, with the exception of the first baby boom, in which the birth rate reached 4.3, the birth rate has declined every year since 1950⁵.

On this issue, we can find the following references. Wang, W., Impact Analysis of Causes of Low Birth rate and Aging in Japan, which summarizes the process of Japan's declining birth rate phenomenon, which will also be cited in the following. Hisakazu Shindo [3], Impact of Low Birth rate on Higher Education, It also points out the impact of Japan's declining birth rate impact on higher education. Akira Sakai, New Immigration Policy of Japan in the 21st Century Coping with Aging and Shortage of Labor Power, It is suggested that the Japanese government should further import foreign labors. Chinese scholars are also very concerned about the problem of low birth rate and population aging in Japan. For example, Wang L.Y. & Zhang J. [5], On the Application and Improvement of Talent Assessment Technology in the University's Self-enrolment, on the reform and response of the enrollment system in Japan. Hu Y.L., Low Birth Rate and Crisis in Private Universities in Japan, these papers discusses the problem that higher education is facing the impact of minority

³The Cabinet Office of Japan, Declining Birthrate White Paper, 2017, Chapter 1 Status of Response Strategies to Low-Fertility Society, https://www8.cao.go.jp/shoushi/shoushika/whitepaper/measur/w-2017/29webgaiyoh/html/gb1_s1-1.html (retrieved on September 15, 2019).

⁴same as above.

⁵same as above.

education. In economics and Industries, Wu X. Y. & Wang Y. Z. [5], The Demographic Crisis Block Japan's Long-term Growth, this paper explains the current situation and reasons of Japan's aging population and low birth rate, analyzes its negative impact on Japan's long-term economic growth, and points out a series of economic structural reform measures including the labor market to cope with the population crisis. Wu X. & Zhou X.W. [6], The Effect of population Aging with Fewer Children to Japan's Economy and Enlightenment to China-Based on the Angle of Labor Supply. It is pointed out that China should follow Japan's example and face this problem as soon as possible.

From the references review, we can see that the problem of declining birth rate in Japan is only focused on the education or only on the economics or industries. That is to say, most of them focus on a single subject. The purpose of this paper is to explore the process of Japan's treatment of the phenomenon of declining birth rate as a crisis management, which first affects education and then to the economics and industries.

According to Wang W., after World War II, Japan's population experienced a period of rapid decline in terms of the birth rate from 1945 to 1946. From 1947 to 1949, the birth rate was at its peak, which marked the first baby boom, and in these three years, a total of about 8.06 million people were born. The people born in this period were called "the Dankai Sedai", and now, they are over 60 years old and will soon form a huge group of seniors [7-10]. After the baby boom, the birth rate in Japan dropped rapidly, and the number of newborns is currently about 1.6 million per year. Due to the traditional high birth rate and high mortality, the age composition of the Japanese population has maintained a pyramid form from pre-war to 1955. As a result of the decreased birth and mortality rates after World War II, Japan gradually started its declining birth rate and population aging process in 1955⁶.

From the mid-1950s to the mid-1970s, the birth rate in Japan stabilized at a certain level, and was maintained at a more appropriate level for population replacement. These two decades witnessed the smooth development of the

Japanese economy, and significantly improved national living standards.

The number of children expected by each couple was roughly two to three, with an average of just over two, and this stable population dynamic lasted for about 20 years. Since the late-1970s, new changes have taken place, meaning a fertility rate of 1.91, which fell below 2 for the first time in 1975, and kept falling afterward. When it fell to 1.57 in 1990, it was called "the 1.57 crisis"; however, Japan's declining birth rate did not stop. In 1995, the total birth rate in Japan was 1.43, which set a record low. In 1997, the total birth rate fell to 1.39; in 1999, it fell sharply from 1.38 in 1998 to 1.34. In 2001, the number of newborns in Japan was 1.17 million, which was about 19,000 fewer than that in 2000, and the total birth rate was 1.336. By 2005, the total birth rate dropped to 1.257. In 2002, the number of newborns in Japan was 1.156 million, which was a decrease of 15,000 from the previous year. This was the second of two consecutive years that Japan saw a decline in its number of newborns. At that time, Japan's National Institute of Social Security and Population Studies predicted that the total population of Japan would reach a peak of 127.701 million in 2006 [11,12]. Later, the number of newborns will be lower than that of the number of deaths, thus, the total population will continue to decline. By 2027, it is estimated that the total population of Japan will fall to 120 million, and by 2040, the total population of Japan will fall below 110 million. Moreover, by 2050, the ratio of elderly people over 65 years old in Japan will be 35.7%, while the average life expectancy of Japanese men and women is 80.95 years old and 89.22 years old, respectively. According to this estimate, the elderly will account for one-third of the Japanese population at that time⁷.

In fact, the progress of population aging in Japan is faster than expected. The demographic statistics, as released by the Ministry of Health and Welfare in Japan, show that in 2005, the number of newborns in Japan was about 1.062 million, which was a decrease of 48,000 from the previous year, while the number of deaths was about 1.083 million, meaning that there were more deaths than newborns, and the population of Japan started to decline for the first time since 1899⁸. The chart below shows the trend of Japan's declining population.

⁶Wang, W, *Impact Analysis of Causes of Low Birth rate and Aging in Japan*, I-Shou University Journal of Humanities and Social Science, 2006;1(9): pp. 38-39.

⁷same as above, pp. 38-39.

⁸same as above., pp. 40.

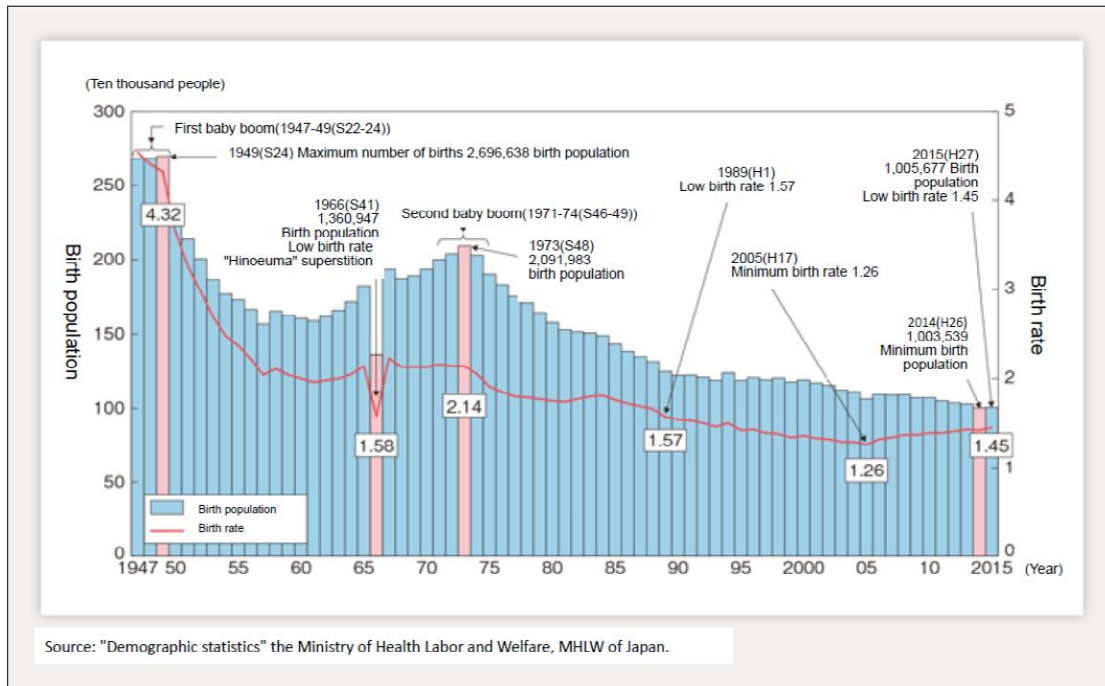


Fig. 1. Population trend of Japan after World War II

(Source: *Declining Birthrate White Paper, 2017, The Cabinet Office of Japan*
https://www8.cao.go.jp/shoushi/shoushika/whitepaper/measures/w-2017/29webgaiyoh/html/gb1_s1-1.html
 retrieved on September 15, 2019)

3. ISSUES WITH EDUCATION UNDER DECLINING BIRTH RATE

The phrase “declining birth rate” (SYŌSIKA) originates from Japan. Japan was the first country to notice the phenomenon of the declining birth rate, and to regard the declining birth rate as a serious social problem, and thus, was among the earliest countries to propose response strategies. However, even though such low fertility was gaining attention in Japan, the established facilities were caught in a dilemma, meaning that they could not sustain the status quo of the previous population (e.g., shutdowns of high schools, vocational colleges, and universities, poor performance of local businesses, etc.). In addition, Japanese society has faced economic stagnation due to the loss of its consumer population (the so-called “two depressed decades”), which urged the Japanese government to accelerate its efforts to promote related declining birth rate response strategies.

Since 1994, the Japanese government has formulated a series of measures to reduce the effect of low fertility, and even established a dedicated ministry in charge of low fertility issues

in its government planning⁹. For example, in 2005, the Koizumi Cabinet set up “a new dedicated cabinet ministry (the ministers of low fertility, food security, and civil affairs jointly serve on this dedicated ministry)”¹⁰. After all, Japan is a recognized economic power that has lasted for half a century, and if its social economy collapses due to the declining birth rate, it will seriously shake the confidence of the Japanese people.

Regarding education, when facing a series of shocks brought by the declining birth rate on education, the Central Education Review of the Ministry of Education, Culture, Sports, Science and Technology of Japan proposed comprehensive analysis and a strategy for the

⁹For example, in 1994, the Angel Project was launched; in 1999, the New Angel Project was launched; in July 2003, the Basic Law for the Social Strategies to Low-Birth Rate Society was adopted; in 2009, the Child Care and Nursing Business Law was introduced. Chen H.W., Flat View of Japan, September 25, 2016, <https://kknews.cc/world/kka88q.html> (retrieved on September 16, 2019).

¹⁰In 2005, the cabinet of Prime Minister Junichiro Koizumi set up a dedicated minister who aims to improve low birth rate and lead the public in joint participation in organizations related to low birth rate, including meetings.

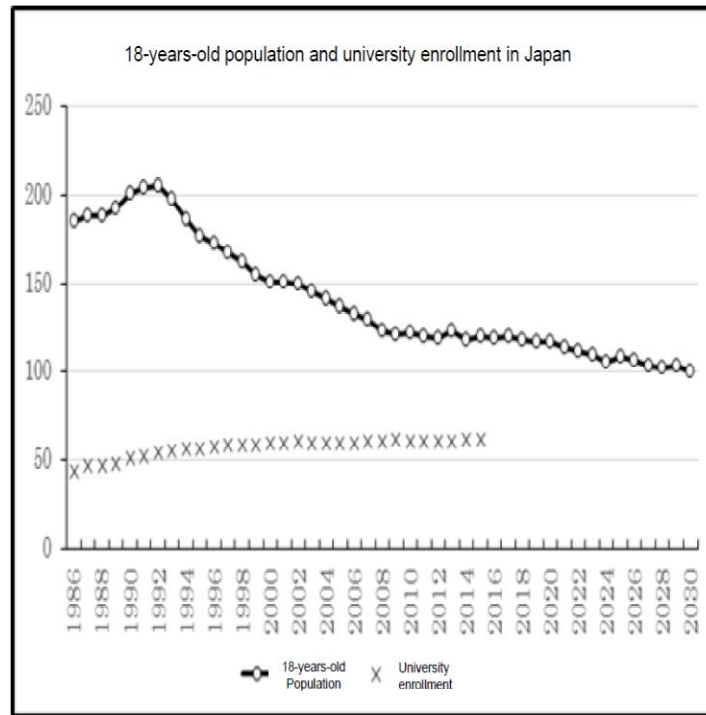


Fig. 2. University enrollment population table of Japan
 Source: Hisakazu Shindo, *Impact of Low Fertility on Higher Education*

impacts of low fertility on education in 1998 (on the issues related to low fertility and education)¹¹. The Central Education Review Council believed that the background of the low fertility issue in Japan lies in the temporal-spatial problem, which is an inevitable phenomenon.

Regarding the current birth rate, it is impossible to alleviate low fertility issues in a short time; therefore, on the policy side, the impact of low fertility on education must be kept to a minimum. In order to improve the low fertility, we must strive to create a social environment that can improve the low fertility rate; this is the basic idea in response to the impact of low fertility on education¹².

Regarding strategic promotion, the following recognitions should be pre-established:

First: The individual decisions on marriage and birth should be respected. The government

should provide adequate social and economic support, and prioritize a favorable environment for marriage and birth¹³.

Second: When constructing a favorable environment for marriage and birth, the regional authorities should have sufficient knowledge of the environment supporting marriage and birth. This is an extremely important part¹⁴.

Third: Parenting is the task of all society. It is the responsibility of every adult to ensure that children grow up soundly. This is a basic understanding¹⁵.

Fourth: Parenting is a common task for men and women. Based on the government's policy of basic social law, such as gender equality in 2000, men and women should raise children together and share their responsibilities¹⁶.

Japan's Central Education Review Council of the Ministry of Education, Culture, Sports, Science, and Technology has established work plans at all

¹¹ Ministry of Education, Culture, Sports, Science and Technology, Central Education Review Council, *On the issue of low birth rate and education, 1998*. http://www.mext.go.jp/b_menu/shingi/old_chukyo/old_chukyo_index/toushin/1309769.htm (retrieved on September 16, 2019).

¹² same as above.

¹³ same as above.

¹⁴ same as above.

¹⁵ same as above.

¹⁶ same as above.

levels in schools. There are specific strategies targeting family education, school education, and social support, and universities have also begun to carry out integration and feature development programs¹⁷.

Due to the space limitations of this paper, details are not offered. In short, as the Japanese government has suffered from the impact on education caused by years of low fertility rates, and has made long-term preparations and psychological building, it has overcome its embarrassment of handling the low fertility issue, unlike Taiwan, which has only faced the low fertility in recent years¹⁸.

4. ISSUES OF AGING INDUSTRIES

Although the low fertility rate first hit the education industry, the aging industries and labor shortage, as derived from the low fertility rate, are more serious, as these issues will aggravate the social welfare burden of the country and increase the support ratio of the labor force. Compared with the industrial impact of low fertility on education, aging industries and labor shortages are the subjects that shake the lifeline of the entire country. Therefore, when the low fertility issue was raised from the educational level to the industrial level, the Japanese government also raised their level of response, and the Prime Minister directly convened cabinet meetings to establish related guidelines and policies.

As mentioned in the “Background” section of this paper, Japan’s low fertility issue occurred earlier than predicted, and Japan officially entered the first year of population decline in 2006. In other words, since 2006, Japan has officially faced the double burden of low fertility and high aging rates.

According to research, to address the problem of insufficient labor, Japan must introduce 600,000 laborers from abroad each year to maintain the same level of economic growth¹⁹.

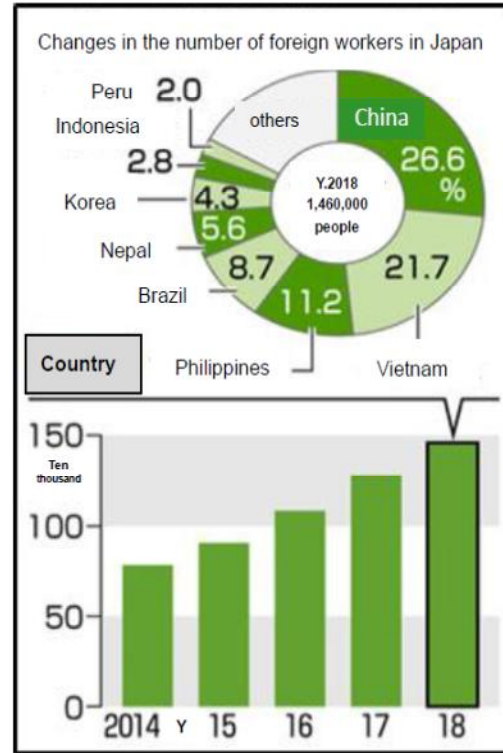


Fig. 3. Tokyo News, “The number of foreign laborers has set a new record of 1.46 million, and has tripled in the past ten years”. January 16, 2019

In a cabinet meeting held on December 25, 2018, the Japanese cabinet adopted amendments to the “Import Management and Refugee Recognition Act” to substantially relax the employment categories and thresholds for introducing a foreign labor force. On April 1, 2019, the “Import Management and Refugee Recognition Act” officially came into effect, which is expected to bring 340,000 foreign laborers to Japan within five years. In fact, prior to this Act, the foreign labor force population was significantly increased in the past ten years, thus, the amendment in 2018 only expanded the categories of occupations introduced. Since the beginning of 2000, Japan has opened up to a foreign labor force in the name of “technical

¹⁷ Hisakazu Shindo, *Impact of Low Birth rate on Higher Education*, Yamanashi Institute, News Letter, 2018;238(2): <https://www.yafo.or.jp/2018/05/31/9762> (retrieved on September 16, 2019).

¹⁸ The low birth rate problem in Taiwan occurred at a later stage than that of Japan, but is now occurring at a very alarming rate. While the reasons are similar in both cases, it is more serious in Taiwan. Since the 1980s, the number of newborns has slowly declined from more than 400,000 with an annual decline rate of 10,000 to 20,000; the low birth rate situation in the past ten years was more prominent, and the number of newborns in 2009 was only 191,310. As the year 2010 was the Year of the Tiger, under superstitious influence, the number of newborns in the whole year was 166,886, which set a record low, and is bound to impact preschool, preliminary, middle, and higher education. In March 2010, Taiwan’s Ministry of the Interior solicited slogans that encouraged childbirths, and all the counties and cities launched childbirth benefits to stimulate birth rate.

¹⁹ Akira Sakaki, *New Immigration Policy of Japan in the 21st Century Coping with Aging and Shortage of Labor Power*, Chiba Institute of Science, 2008;1: pp. 89.

interns". By the end of 2017, the population of the foreign labor force in Japan was 1,278,760, meaning the population of foreign laborers was increased by 600,000²⁰ between 2012 and 2017. Later, the population of foreign laborers in Japan kept increasing. In October 2018, meaning before the amendment to the "Import Management and Refugee Recognition Act" was reviewed by the cabinet meeting, the working population of foreign laborers in Japan reached 1,460,463, which was an increase of 14.2% over the previous year, and set a new record high²¹.

5. RESULTS OF THE CASE STUDY

As we have learned from the crisis management strategy of Japan, which is the first country to experience and seriously respond to low fertility issues, Japan has adjusted its own society by conforming to the trend of the times and re-establishing awareness among the public. For example, regarding education, the Japanese government has taken active response strategies and conducted education based on social support and public cognition. It has also emphasized that marriage and parenting are not the responsibility of just the family or women, but is a mission for society that includes both men and women. In terms of the introduction of the industrial labor force, the shortage of laborers will impact industrial development; therefore, the Japanese government has strategically introduced foreign laborers since 2000. Initially, Japan reduced the impact of low fertility on its domestic market by introducing foreign laborers in the name of "technical interns"; later, it gradually opened up its border, and finally, amended the Act to systematically reduce its shortage of laborers.

Although the problem of low fertility in Japan is still severe today, the Japanese government has made clear plans to manage the crisis, and gradually solve the impact of aging and low fertility. At present, East Asian countries are gradually facing the crisis of aging and low

²⁰Nihon Keizai Shinbun, the number of foreign laborers has set a new record of 1.2 million, and Ministry of Health, Labor and Welfare are deeply dependent on foreign laborers. January 26, 2018, <https://www.nikkei.com/article/DGXMZO26189750W8A120C1EA4000/> (retrieved on September 16, 2019)

²¹Tokyo News, the number of foreign laborers has set a new record of 1.46 million, and has tripled in the past ten years. January 26, 2019, <https://www.tokyo-np.co.jp/article/politics/list/201901/CK2019012602000151.html> (retrieved on September 16, 2019).

fertility, and should refer to the valuable experience of Japan in handling the issues related to aging and low fertility.

6. DISCUSSION AND CONCLUSION

This study explored the response strategies taken by Japan in the face of low fertility and high aging population in Japan from two aspects. First, this paper studied the impact of low fertility on education, and then, investigated the effect of aging on industry. In fact, the two issues are essentially interlocked. Specifically, low fertility affects education first, and then, further affects the supply of a labor force. In more severe cases, it will affect economic development and public lives.

From the perspective of the future sustainable development of the earth, low fertility can reduce the pressure on the global environment after the industrial revolution, meaning a population decline will reduce the impact on the environment and have positive impact on the environment and resources. However, for the current state and people, low fertility will affect the current economic life and industrial development. Therefore, when individual countries are pursuing the sustainable development of their own country, low fertility is an unfavorable population phenomenon. Population control and economic development has always been a contradiction, but also an inseparable problem. How to achieve a balance is still a question we must ponder in the future.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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