

Analysis of Boeing's "Degradation" from the Perspective of Cultural Management Transformation

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Abstract

30 years ago, Boeing, an aerospace giant, acquired McDonnell Douglas, however Boeing repeated the mistakes of McDonnell Douglas after 30 years. Boeing's overall cultural management has decayed and has been replaced by McDonnell Douglas' corporate culture. All decisions are centered on short-term profits, thus planting the seeds of Boeing's long-term degeneration. From the perspective of cultural management, this paper analyzes the changes before and after Boeing's acquisition of McDonnell Douglas, and by studying the reasons for Boeing's "degeneration", it provides management ideas for business operators and decision-makers, and promotes the smooth implementation of cultural management thoughts. At the same time, it provides a useful reference for the government to carry out the industrial layout of the civil aviation manufacturing industry.

Keywords

Boeing; Degraded; Cultural Management.

1. About Cultural Management

Cultural management is a kind of management mode, a set of behavioral methods advocated by the management of the enterprise and abided by the upper and lower levels of the cultural tradition and constantly changing. Management by means of culture is also the process of establishing corporate consensus. Culture is a management method or tool at the highest level, which is reflected in corporate values, business philosophy and behavioral norms, and permeates the entire process of corporate decision-making, organization, incentives, and leadership.

Corporate cultural management reflects the overall beliefs and values of enterprises that are consistent with the overall goals of enterprises, including cultural awareness and management. Among them, cultural awareness refers to the awareness of all personnel in the enterprise for cultural concepts, as well as their attitudes and habits when completing related work. The formation of this consciousness is an individual manifestation of the overall strength of the enterprises. Compared with the content at the awareness level, cultural management refers to the specific management methods and management tools used by enterprises in cultivating, implementing and developing culture. When any management concept and culture is transformed into the ultimate driving force of an enterprise, it is inseparable from the support of correct management methods and management tools, as well as in-depth implementation.

2. The Transformation in Corporate Culture

Before 1997, Boeing regarded quality and safety as its life, pursued the manufacture of large, fast, advanced and better performance aircraft, continuously strengthened research and development, and pursued innovation, thus creating countless firsts in the aviation industry. It was a giant in the world's aviation industry, a model of high-tech and precision manufacturing in the world, and a practitioner of "integrity, quality, and safety", which enabled Boeing to set up an admirable peak in the world. Boeing is, as writer Jerry Usim says, "An association of engineers whose mission is to make amazing aircraft." It puts design and quality above everything else, and adheres to a "safety first" lifeline. Such a corporate culture has greatly promoted the development of Boeing, and created a series of legendary aircraft that shine in the annals of history, maintaining the absolute advantage in the field of large jet aircraft manufacturing.

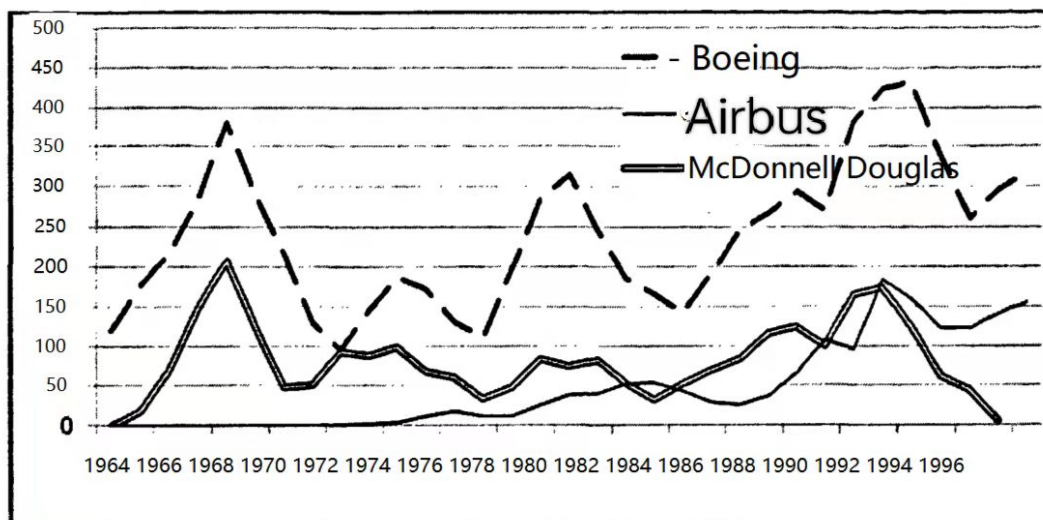


Figure 1. Airplanes produced by Boeing, Airbus and McDonnell Douglas (1964-1996)

In August 1997, Boeing acquired McDonnell-Douglas, which was on the verge of bankruptcy. The adjustment of the pattern of the world aviation industry is also a turning point in the history of Boeing's development in the past century. Boeing had strong technology, good reputation and stable business. It can be described as the "grandfather" in the field of civil aviation. The acquisition of McDonnell Douglas can be said to be a predator of the weak and has more advantages in resources, capital, and technology. Although the new giant was named after Boeing, its culture and strategy were derived from McDonnell-Douglas. After entering the 21st century, the culture of Boeing had gradually changed under the influence of McDonnell-Douglas. The First was the adjustment of the company's leadership, followed by changes in development strategies and corporate culture. There were 18 Boeing executives after the merger and acquisition, of which 10 were external professional managers, 7 were from McDonnell-Douglas, and only 1 was from the original Boeing. It seemed that Boeing had merged with McDonnell-Douglas, but in fact it was McDonnell-Douglas's "profit first", emphasizing stock price management, and the corporate culture dominated by financial players that had squeezed out Boeing's Quality Priority, R&D-focused, Engineer-Oriented Corporate Culture. Boeing management had continuously weakened the voice of the engineering department and relied on outsiders with no engineering background. The original McDonnell-Douglas management personnel had become the key figures in the fate of Boeing. Boeing would undoubtedly embark on the old path of McDonnell-Douglas, at the expense of the future development of the company.

This change was reflected in the following aspects. Firstly, the rise of financial management culture made the engineer culture in the company begin to decline, and the communication between engineers and management become more difficult. For companies that are known for their high-precision and cutting-edge technologies, the design and innovation capabilities of engineers are the key, but now they are putting the cart before the horse. Secondly, the growing culture of outsourcing permeated Boeing's supply chain and was committed to controlling the company's costs, outsourcing (global sourcing) on a large scale and squeezing suppliers to cut financial expenses. McDonnell Douglas' mistakes were repeated at Boeing when it approved the program for the next-generation twin-aisle 787. To meet its goal of lowering costs—that is, half the development cost of its predecessor, the Boeing 777, Boeing had massively increased the use of suppliers, most of whom were unfamiliar with the relevant business. In order to improve the return on equity investment, Boeing sold a large number of assets and auxiliary plants. In the end, due to excessive outsourcing, the delivery of the passenger aircraft was delayed for three years and billions of dollars were lost. Moreover, outsourcing was difficult to control the quality, resulting in frequent failures. Third, in 2001, Boeing moved its headquarters from Seattle, the center of design and production, to Chicago, a city in the heart of the United States, closer to the financial institutions of Wall Street, but only the company's top management and more than 500 employees went to Chicago. More than 40,000 engineers from Boeing and its various aircraft factories remained in Seattle, thousands of kilometers away. There were also fewer and fewer directors with engineering backgrounds on Boeing's board of directors, and more directors with financial capital and hedge fund backgrounds were replaced, which directly affected Boeing's internal decision-making.

Generally speaking, the root of Boeing's "degeneration" laid in the culture, which was the conflict between the culture of pursuing short-term efficiency and interests and the engineer culture accumulated over the years by the original Boeing. The organizational values and employees' work values shaped by Boeing's cultural management did not drive the company's development. Cultural management behavior run through the leadership behavior from beginning to end, and was even raised to the height of enterprise strategy by it. However, the adjustment of Boeing's leadership after the acquisition had led to changes in Boeing's tactics and strategy. In the past 30 years of Boeing management, the financial instruments advocated by successive leaders were ubiquitous. Controlling costs, reducing capital investment, reducing or not increasing R&D investment, and selling non-core industries were negative in terms of long-term or unpredictable consequences.

3. Transformation in Management Mode

After the merger of Boeing and McDonnell-Douglas, the two CEOs were "airborne" from General Electric (GE), on the other hand, emphasizes cost management and pursues efficiency. All values were based on market share and profit, and it was no longer a manager who infiltrated the engineer culture and grew up from Boeing. Thirty years ago, McDonnell Douglas's management model that catered to Wall Street finance was all the rage. After the acquisition of McDonnell-Douglas, Boeing's management model focused on the universality of managers, emphasizing cost management and efficiency, and believed that there was no essential difference between managing high-end manufacturing companies and managing large supermarkets such as Walmart. Walmart is a chain retail enterprise, which adopts the "three-low" mode of operation with low price, low cost and low price increase. It basically sells fast-moving consumer goods, which are characterized by small profits but quick turnover. If you want to be profitable, you can only rely on selling huge quantities. However, the manufacture of aircraft requires high-end technical support, and it costs a lot of self-built research and

development. At the same time, the global market for aircraft is much narrower than that of Walmart.

The most direct reason for Boeing's "degeneration" is that it adopted the wrong management method of the company and followed the Walmart management model to build airplanes. In order to sell the plane quickly and return the funds as well, Boeing kept cutting costs, launching new products, and driving down prices through quantity. Such a low-cost, fast-food-style aircraft would inevitably lower its quality standards. But for every civil aviation person, safety is an insurmountable red line. An aircraft without quality assurance will inevitably lead to hidden safety hazards.

Even if Walmart improved efficiency by outsourcing its cars, it couldn't manufacture large aircraft with the same mindset. Although automobiles are large equipment manufacturers, their production volume and complexity are far lower than those of passenger aircraft projects, and their safety requirements are far less stringent than those of the aviation industry. Large aircraft are high-end manufacturers with high unit price, low production and strict safety requirements. Boeing's management had outsourced and de-industrialized the company's business layer by layer, completely transformed Boeing's production line, and increased the company's price in the capital market to meet profit needs and executive dividends. Engineers need to synchronize and coordinate problem solving and innovative thinking in the process from passenger aircraft design to manufacturing. The synchronization and coordination within the company was more convenient, while the synchronization and coordination with suppliers outside the system requires modification of contracts, legal audits, etc., which was time-consuming and labor-intensive. Under the strong pressure to save costs as planned, engineers' opinions were often suppressed, and in the long run, these hidden problems would always break out.

The Design of high-end equipment manufacturing required more knowledge workers, especially engineers, to participate in advanced management. However, from the analysis of the composition of Boeing's board of directors in 2002 and 2018, the proportion of board members from high-end manufacturing industry in Boeing directors had declined rapidly. In 2002, 6 out of 11 board members were from high-end manufacturing, more than half of the total. In 2018, Only 4 of the 13 board members had manufacturing backgrounds, less than one-third of the total. Conversely, the number of directors from the financial sector increased from one to four. Financial figures and former senior government officials made up the majority of the board, and there were few people on the board with deep aviation technology and engineering backgrounds. The layman's leadership in managing the business, focusing more on cost and efficiency, on the market and on the stock price, forced Boeing engineers to abandon strict practices, and technological innovation and R&D decisions were hardly taken seriously. In specialized industries such as aerospace, it is critical to have board members with relevant technical or safety backgrounds. The composition of Boeing's board of directors also illustrated the transformation of Boeing's financial management model.

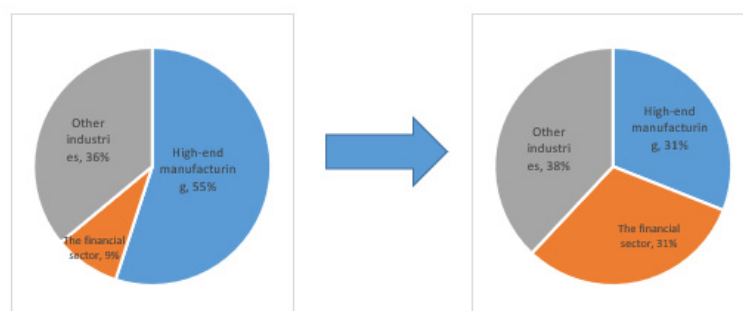


Figure 2. Analysis of board composition in 2002 and 2018

4. The Transformation in Profit Model

King Boeing has "degenerated" so far, which basically mean that it had lost its culture and soul and had become a tool for making money. Since 1980, the United States has gradually loosened the control of the financial industry, and the virtual economy of the financial industry represented by Wall Street has expanded rapidly with high profits. In the year of the acquisition of McDonnell Douglas, the stock price became the core of Boeing's topic, when it implemented a value-sharing programmer to allow everyone to participate in stock speculation to increase the stock value.

From the perspective of changes in market value, Boeing's stock price was only \$77.08 in early 1997. By 2019, Boeing's stock price reached its historical peak of \$ 443.49, an increase of 475%. Equity and option incentives used the compensation management methods of modern financial tools to link executives' income with company performance (important company stock price).

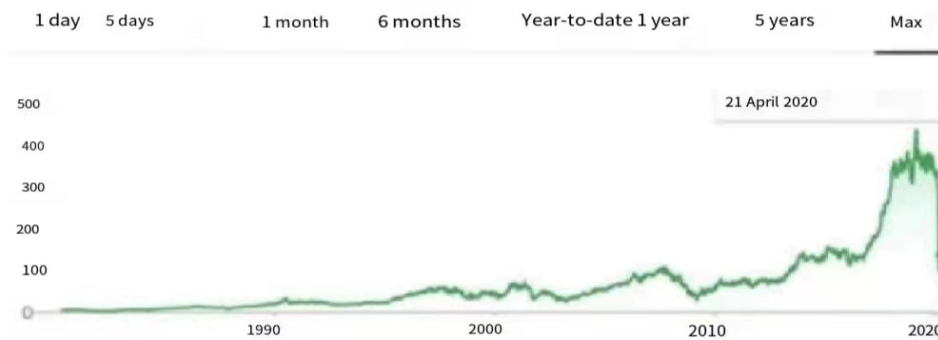


Figure 3. Stock price change of Boeing Company from 1990 to 2020

For example, in 2016, Boeing's 787 and 737 Max were so popular that the stock price more than doubled. The main income of executives is stock options, which had made them billionaires already. In the compensation structure of Boeing CEO (chief executive officer), CFO (chief financial officer) and EVP (executive vice president) in 2017, stock incentives accounted for 34.2%, 69.4% and 48.5% of the total compensation respectively. Almost 70 percent of CFO compensation, about \$12 million, came from stock incentives. This incentive system had led executives to focus not on company performance, but collectively to maintain and push up the stock price.

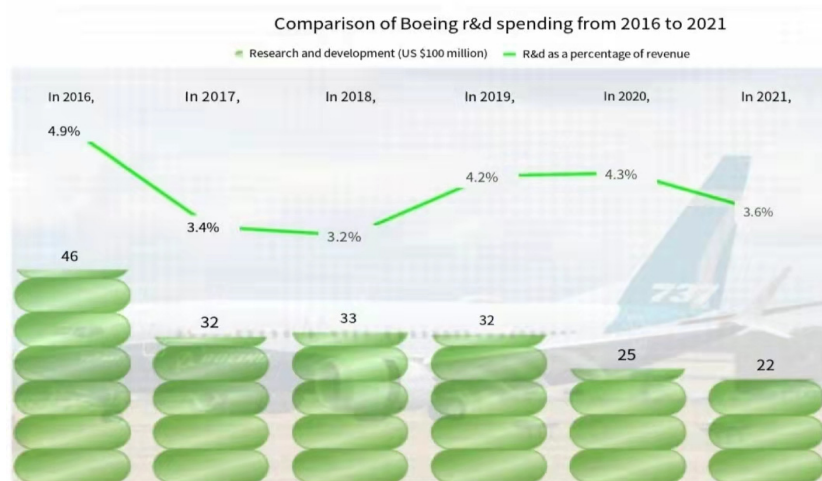


Figure 4. Change trend of Boeing R&D investment from 2007 to 2018

From 2014 to 2019, Boeing repurchased shares at all costs. According to statistics, Boeing spent a huge amount of capital on stock repurchases. During the five years, it spent a total of \$59.9 billion in repurchases and dividends, which was equivalent to the cash flow of \$55 billion generated during that period. However, during this cycle, Boeing’s cumulative investment in research and development of commercial aircraft was \$14.1 billion, which was only 30% of the share repurchase scale: the average annual expenditure was only about \$2.36 billion, which was less than dividends for successive years.

Nowadays, Boeing has no longer focused on R&D and innovation. In 2009, the revenue of Boeing Civil Aviation was \$34.5 billion, of which R & D expenses were \$5.38 billion, accounting for 15.8 % of the total. In 2012, the revenue of Boeing Civil Aviation increased to \$49.1 billion, but the R & D expenses fell to \$2 billion, accounting for only 4.17%. R & D expenses had decreased by 11 percentage points over the three years, a drop more than 70 percent.

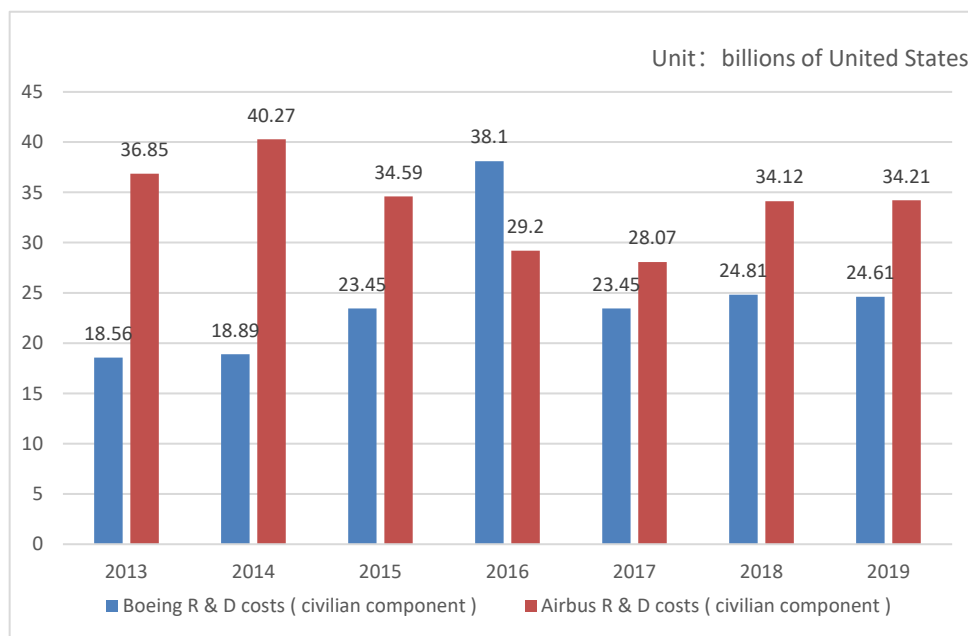


Figure 5. Comparison of R & D costs (civil part) between Boeing and Airbus from 2013 to 2019

From 2013 to 2019, Boeing invested \$17.19 billion in civil R & D expenses, while Airbus (the only competitor of Boeing at this stage) invested \$23.73 billion. It turned out that Boeing spent nearly 30 percent less on R&D than Airbus. In the seven years, only in 2016, only in 2016, Boeing's R&D expenditure was higher than that of Airbus, and the remaining six years were less than that of Airbus, including the total R&D expenditure of military products. During this period, it was \$23.74 billion from Boeing, \$26.5 billion from Airbus. Boeing was also 10 percent less than Airbus.

Boeing continued to reduce R & D expenses. Under the stimulation of stock repurchase and other means, Boeing's stock price had doubled, which theoretically conformed to the US corporate governance tenet of "maximizing the interests of shareholders", But it was Wall Street investors and Boeing's top executives who had made the biggest profits. For example, Boeing's then-CEO Muilenburg received a total of more than \$70 million in compensation from 2015 to 2018.

From the launch of Boeing's new models, it could be seen that Boeing carried out the research and development of three models every ten years in the 1950s and 1960s.

After the annexation of McDonnell Douglas, Boeing was unwilling to invest heavily in product research and development, so the only brand new aircraft launched in the past 20 years is the 7. Together with the abandonment of research and development in "subsonic cruiser", there were only three models in the past 20 years, which was only half of that in the 1950s and 1960s. It failed to launch new models in time. Moreover, in the passive upgrade, the blind pursuit of the shortest cycle and the smallest investment made it impossible to effectively solve technical conflicts, and ignored quality and safety. In addition, continuous accidents were also the bane of excessive financialization.

Table 1. Launch dates of Boeing aircraft

Time	In the 1950s	In the 1960s	In the 1970s	In the 1980s	In the 1990s	At the beginning of the 21st century
Put into production	B707 B727	B737 B747	--	B767 B757	B777	B787
To give up	B717	SST	--	--	--	Subsonic cruiser
A combined	3	3	0	2	1	2

In 2011, The Seattle Business Journal admitted that Boeing had turned from a family-oriented research company to a profit-driven manufacturing plant. Boeing's "degeneration" started from making quick money. It pursued short-term interests and emphasized stock price management, especially stock repurchase with the company's own funds, so that shareholders and equity incentive management could achieve a win-win situation. The price was the future development of the enterprise.

5. Coming of a Crisis

On March 21, 2022, a Boeing 737 of China Eastern Airlines crashed over Wuzhou during the Kunming-Guangzhou flight, killing all 132 people on board. The accident has plunged Boeing into a huge controversy once again. Since two air crashes in 2018 and 2019, Boeing has been hit hard, and its safety has been questioned. Boeing is facing a crisis of confidence.

Switching from an engineering culture of higher quality to a Wall Street style of profits and costs, Boeing has reaped years of rewards while contributing to crashes like Lion Air in 2018 and Ethiopian Airlines in 2019. Boeing is suffering from the lowest annual delivery record in 40 years, losing money for 24 consecutive months, and continuing to pay for returns. Boeing is no longer the model company that focuses on technology and products, and its once-proud safety culture has been left behind under the pressure of Wall Street's money worship. Boeing's management team and board are primarily concerned with revenue and bonuses, rather than the health of the company.

The safety of Boeing series aircraft has also been questioned. In 2019, Boeing said that 810 737 NG series passenger aircraft were inspected by national aviation operators, and 38 with structural cracks were found, which needed repairs and replacement of components. According to ASN statistics, Boeing and Airbus accounted for 43 % and 45 % of the global civil aviation passenger traffic in 2018, respectively. However, in terms of accident data comparison, Boeing was several times that of Airbus. According to the statistics of global commercial jet flight accidents released by Boeing, in the more than 50 years from 1959 to 2013, there were 163 flight accidents involving Boeing aircraft, including 78 crashes.

Table 2. Major accident statistics of Boeing main aircraft

Boeing	737-200	737-300	737-400	737-500	737-700	737-800	737-900	737MAX	747-100	747-200	747-300	747-400	777-200	777-300
The number of deaths	346	661	37	118	3	579	0	346	1499	1395	228	128	541	1
The delivery number	1059	1113	486	389	1128	5075	542	350	251	255	56	694	569	969

According to Aviation Safety Network data, over the past 20 years, the proportion of supersonic aircraft accidents in the world has been increasing year by year. From January 1, 2019 to March 12, 2019, there had been 7 Boeing aircraft accidents, accounting for 30.4% of the world's aircraft accidents. Among them, the Boeing 737, Boeing 747 and Boeing 777 have the most fatal crashes in the world.

Table 3. Inventory of Boeing 737-800 aircraft accidents in the past 16 years

Time	The event	The number of casualties
September 29, 2006	Goel Air Flight 1907 in Brazil	The deaths of 154 people
May 5, 2007	Kenya Airways Flight 507	The deaths of 114 people
February 25, 2009	Turkish Airlines flight 1951 accident	Nline people died and 120 were rescued.
May 22, 2010	5.22 Air India crash	159 people died and eight were rescued.
July 30, 2011	The accident of Caribbean Airlines Flight 523	One seriously injured several lightly injured, no fatalities
April 13, 2013	Lion Air jet crashes into sea in Indonesia	Forty-five people were injured, no deaths
March 19, 2016	Dubai Airlines flight 981 disaster	The deaths of 62 people
January 13, 2018	Turkish Pegasus Airlines Flight 8622	Three people suffered minor injuries
September 27, 2018	Air New Guinea Flight 73	One people died
February 5, 2020	Turkish Pegasus Airlines Flight 2193	Three people were killed and 179 injured
March 21, 2022	Eastern Airlines flight MU5735 crashed	The deaths of 132 people

Boeing 737 series is known as the most successful civil aviation aircraft in the aviation history, and it is the aircraft with the most air crashes in history as well. From aviation giants to today's "depravity", from high-end manufacturing focused on quality and R & D to financial players obsessed with rising stock prices, engineer culture is stifled by financial culture, and short-term profits replace long-term growth. Although the series of high-light mergers and acquisitions in the 1990s did not directly lead to the bleakness of Boeing today, and there were many performance highlights in the following years, Boeing's strategic direction and corporate culture quietly changed and planted the seeds of degeneration. Even with the assistance of the U.S. government to tide over the current difficulties, Boeing can hardly return to its former glory. After all, it wasn't a few plane crashes or an epidemic that knocked it down.

6. Rational View of Crisis

If Boeing wants to get rid of the current predicament, it cannot be achieved by changing a CEO. Boeing must break away from financialization, back to the old Boeing "integrity, quality, safety" banner, so as to restore Boeing's tradition of innovation, research and development, and leadership in the development of the industry. It needs to increase R & D investment and employee training in order to improve product quality and safety instead of spending all of it fund on stock repurchases and excess dividends. The transformation of Boeing requires cutting off the company's board of directors and executives from the company's financial interests, tying their interests to the company's long-term development, giving up personal immediate interests and pursuing the long-term development of the company instead. Boeing's return and reinvigoration has a long way to go.

Boeing 737 series accidents occur frequently. Is it safe to travel by plane? Because it is a best-selling model, it has a high market retention rate and a high accident rate. China has the world's largest and youngest fleet of Boeing 737-800 aircraft, according to aviation consultancy IBA. With a fleet of nearly 1,200 passenger planes, the average age of the aircraft is about 8 years, which is 5 years lower than the global average age, and it is also the holder of the safety flight record in the world civil aviation history. China has been using Boeing 737NG passenger aircraft since 1997. The crash of China Eastern Airlines Flight MU5735 on March 21, 2022 was the first air disaster of the Boeing 737NG series in China. For a long time, China has had an excellent safety flight record. According to The Civil Aviation News of China, the 10-year rolling death toll of 100 million passenger kilometers, the 10-year rolling major accident rate of 1 million hours and the 10-year rolling major accident rate of 1 million flights of civil aviation in China are all 0, much higher than the world average level in the same period, and also higher than the level of major developed countries.

The safe operation of China's civil aviation continued for 4,227 days, setting a record of the best safe operation in the world's civil aviation history. The accident resets the 4,227 days of continuous safe operation to zero, but it does not mean that China's civil aviation is no longer safe. On the contrary, China is still the country with the highest aviation safety guarantee in the world. However, we believe that when the number is reset to zero and the counting starts again, CAAC, who has re-started after the pain, will have the confidence and ability to continuously refresh this number and create a new record for safe operation.

7. Conclusion

Listing and entering the capital market is a sign of the periodical success of an enterprise. The capital market can solve the financing problem for the development of an enterprise, make the corporate governance structure of the enterprise more standardized, make the production and operation of the enterprise more transparent and compliant, and also help the development and motivation of the employees of the enterprise. Appropriate and reasonable share repurchase and dividends, as well as executive incentives, have positive significance. If it goes too far, it will fall into the trap of corporate financialization. It is necessary to pay attention to enterprise management, strengthen research and development and innovation, pay close attention to the quality of products and services, serve the market and users well, and expand the scale of the enterprise. After that, a value assessment system will be established and a "smell officer" will be set up to ensure that the values of new employees matched the values of the company. The idea of cultural management is introduced into the management, and the enterprise culture is no longer regarded as a supporting role in the production and operation, but it is promoted to the height of strategy. Every link in the daily work of the enterprise is people-centered, and people who form cultural consciousness are regarded as the source of enterprise competitiveness.

At present, China's capital market is becoming more and more open, and all kinds of outstanding enterprises are rushing to join. During this period, Boeing's predicament is a mirror, reminding us to see the lessons of Boeing's past and avoid repeating the same mistakes. This article hopes to give some inspiration to those Chinese entrepreneurs who have been listed or will be listed. The key to the survival and development of enterprises is to create value for customers, and then create wealth for shareholders. The Engineer culture cannot give way to serving capital. Using various financial instruments and operations to increase stock prices and magnify the leverage will put entrepreneurs in danger of falling into the trap of corporate financialization. In knowledge-intensive companies and high-end manufacturing enterprises, employee creativity, engineer design and innovation ability are the keys to success. However, the more critical issue is that the government's control over the core industries cannot be relaxed. In the basic areas related to national economy and people's livelihood, the negative consequences of neoliberal deregulation should be fully paid attention to. Once there is a problem in the top-level design, companies in the whole industry may not be immune.

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