

# [Boeing corp essay](https://assignbuster.com/boeing-corp-essay/)

The objective of this paper is to analyze the commercial jet aircraft industry and more specifically Boeing Corporation to better understand the significance of the role of information systems. At the present time the industry is dominated by two global players; Boeing and Airbus, and their rivalry is in many ways representative of two seemingly incompatiblenot to say totally opposing market philosophies. Boeing is the free market champion, while Airbus represents the not so free approach of the European Unions organized and government subsidized competition in the so called strategic markets. The worldwide market for commercial jet aircraft is primarily dependent on long-term trends in airline passenger traffic.

And this trend can be explained by factors such as economic growth in developed and emerging markets, political stability, profitability of the airline industry, and the globalization and consolidation of the industry.

Other important factors are limitations in air transport infrastructure such as government and environmental regulations and air traffic control. Finally product development strategy and overall competition between manufacturers also Figure 1: World Air Travel, Revenue passenger miles in billions, excluding the former Soviet Union airlines. World air travel has been steadily increasing at an average annual rate of 5%, including in 1994 , with the exception of the year 1991 due to the Persian Gulf conflict.

Despite the steady growth in traffic after 1991, most airlines have cut back their new aircraft orders, mainly due to their dismal financial performance, resulting in dramatic reductions in aircraft manufacturers backlogs. Air France, for instance canceled $500 million in orders from Boeing and Airbus in January 1995. The commercial jet aircraft market is dominated by three major manufacturers; Boeing, Airbus Industrie and McDonnell Douglas.

Table 1 illustrates the revenues and earnings of the three players. Other minor players, such as Fokker, British Aerospace and manufacturers of short haul, turboprop engine commuter planes are not included in the market 1994 Earnings in $m Market Share % 1, 022 62 N/A 24 40 14 Table 1: Revenues and market share of jet aircraft industry leaders, excluding former Soviet Union. The situation in 1994 degraded significantly, and no indication of recovery is in sight for 1995.

Worldwide aircraft shipments dropped sharply from 3189 units to 2402. Boeing registered a decline of 14% in its revenues compared to 1993, and McDonnell Douglas lost market share with its revenues shrinking by 9%. It is likely that McDonnell Douglas will halt temporarilyand perhaps permanently the manufacturing of its wide body MD-11 plane, due to a severe shortage of orders. This may leave for the long term only Boeing and Airbus competing in the long haul, wide body carrier segment.

The current struggle between the three vendors seems to develop at the clear disadvantage of McDonnell Douglas.

Recently, SAS which traditionally had been a faithful McDonnell Douglas customermore than 70% of its current fleet is Douglas, gave preference to Boeing for 35 new B737-600s over the MD-95, a new model that Douglas was counting on SAS for its market Cancellations Net Orders 46 74 54 71 19 4 Table 2: New Aircraft Orders in 1994 In 1994 it looks like Airbus is about to catch up with Boeing in market share, while McDonnell Douglas has further receded: Indeed Airbus claimed it obtained nearly 50% market share in 1994s orders for new aircraft of more than 100 seats. Table 2 summarizes the new orders received by the three manufacturers in 1994. Although Boeing has a current backlog of 959 units versus Airbus 615, if the trend continues, Airbus will soon be in the number one position.

Finally, the industry is very capital intensive, it requires a long time to recoup investments characterized by long development cycles. It needs a large base of skilled workers, high tech sustaining industries and sophisticated and demanding customers to thrive. Government intervention, different countries industrial policies and international trade relationships play also a major role in shaping the industry forces.

b. Typical Industry Competitive Strategy The key competitive strategies used by the three big players can be Extensive aircraft portfolio to satisfy requirements of customer airlines across the board. Boeing is the best positioned with aircraft capacity ranging from 100 passengers (737-500) to 500 (747-400). Airbus had entered the market with small and medium sized carriers, but is fast catching up with the introduction of its four engine long haul A340 aircraft.

Only McDonnell Douglas seems to be relegated to the low end small carriers (MD-80 and MD-90) as its facing the Pushing high technology, electronic fly by wire techniques in order to reduce the number of pilots neededfrom three to twoand establishing easy transfer from one type of plane to another, thus minimizing training time by developing the family concept. As an example, Airbus succeeded in obtaining approval from the FAA to have a single pool of pilots to operate its A320, A330 and A340 Developing solutions to improve cost effective exploitation of their planes, such as the general trend in migration to twin engine wide body planes, providing fuel efficiencies and quick reconfiguration of seating layouts to optimize the ratio of seat occupancy by passenger Leasing and financing services to customers.

As airlines face financial difficulties, financing terms become a key selling factor.

All three competitors run financial services. In 1993, for instance, Boeings customer financing activities amounted to $3, 177 million, up from $2, 295 million while its sales went down to $20, 568 million from an all time high of $24, 133 million in 1992. Airbus is also financing itself 5-10% of its sales.

Alliances, joint venturesespecially with foreign government funded programsand extensive lobbying, political posturing in national and international forums. Some 45 businesses in 6 Asia- Pacific Economic Cooperation (Apec) economies provide Boeing with about 70 different parts and major assemblies… The Porter model provides a structural analysis of the industry any given company competes in. It is not limited to the use of Information Technology, on the contrary it defines in a broad sense all the competitive forces in the market, existing alliances, potential threats and other sources of positive and negative influence.

The analysis of the commercial aircraft industry shows that very few competitors compete for market sharenamely Boeing, Airbus and McDonnell Douglas, and usually they have extremely close relationships with their suppliers and their customers. As a matter of fact, the industry is extremely concentrated. Figure 2: Porter Competitive Model for the Commercial Jet Aircraft Industry The buyers, mainly airlines and leasing companies detain considerable power that is increasing since there is a downturn in orders. As the airlines optimize their operations and cut their investments, the competition among the suppliers becomes deadly. It can also be assumed that the regulating bodies are buyers as well as suppliers. Indeed, the aircraft industry has to constantly deal with these institutions to convince them to approve regulations in their favor and not take decisions that would jeopardize their competitive.

The Bargaining Power of Suppliers

The suppliers can be split in two different groups, based on their Engine manufacturers represent the single most significant group of suppliers and it can be assumed that their bargaining power is going to significantly increase as they undergo concentration. General Electric, Pratt & Whitney (US), Rolls Royce (UK), CFM (Europe) are the main competitors. However, this power is somewhat balanced by the fact that oftentimes airlines enter in separate negotiations with the engine suppliers to determine the choice of the engine for their planes. Planes are usually designed for more than one engine type. On the other hand, the required fuel efficiencies, increased reliability needsespecially for twin engine transatlantic wide bodiesand the need to provide more power for the new large body aircraft require aircraft manufacturers to enter in joint Regulating bodies, such as the FAA, EPA, etc.

, may be considered as suppliers to the industry as they determine a number of constraints that the industry has to deal with.

The bargaining power of these institutions is considerable as they can create major obstacles for the As the industry is extremely capital intensive, all sources of investment and financing detain considerable power. A recent trend is the development of financing and leasing companies who buy planes from the manufacturers, then lease them to various airlines. ILFC (International Lease Finance Corp) is one such company that recently ordered 30 Airbus aircraft.

Meanwhile Airbus Industrie itself has formed its own financing service which has access to more than $1. 5 billion revolving credit facility from 46 different banks. We anticipate that on the avionics and materials side, since the military markets keep shrinking and there is heavy pressure on defense suppliers to move to commercial applications, the bargaining power of these industries as they fight for additional share of the commercial market is at the advantage of the aircraft

At first look, any new entrant in this market faces a steep, uphill battle. Regulations, capital requirements, extremely skilled labor needs and sophisticated support industries, necessary proven track record and the perspective of a long wait to reach profitability are but a few of the very high barriers to entry.

However, one cannot completely exclude this possibility. Just as Europe did, Japan or China may decide that this industry is strategically vital for their long term well being and encourage a highly subsidized entry in the market by their national champions. In the case of Japan, subsidies may even not be necessary as the sophisticated industrial infrastructure and naturally protective trade policies may very well encourage Mitsubishi or another firm to The former Soviet Union represents a significant growth potential for the big three, but also has its own national aircraft industry.

While this market may be open to competition, it also possible that the Russian Tupolev enhances its capabilities, rationalizes its operations and succeeds in entering the market with a low cost, no frills product strategy, especially in emerging countries.

Finally, although highly unlikely, existing defense aerospace companies my be tempted by a late entry or re-entrysuch as Lockheedas they see their traditional military market dwindle. Threats of Substitute Products or Services It is difficult to imagine, for the foreseeable future, a direct substitute for commercial aircraft, especially in the long haul transport. Air travel is the most effective, secure, convenient and economic transportation method. However, a few threats exist, especially in Fast bullet trains offer between cities less than 400 miles apart a very attractive solution.

As their speeds approach and exceed 200 mph, they bring such travel below two hours from downtown to downtown; a performance that hardly any airline can match.

After the start of TGV service between Paris and Lyons, Air Inter faced a 50% reduction in air travel between the two cities. If such solutions are implemented widely in the USAa very speculative assumptionbetween, say San Francisco and Los Angeles for instance, a great many airlines may lose market share and as a consequence reduce their fleets. Likewise, advances in automotive industry, such as cars capable of very high speeds, under electronic control on specially equipped freeways may have an impact on air travel.

Finally, advances in telecommunications techniques, collaborative computing, desktop video-conferencing based on broadband ISDN type services may reduce business travel requirements and impact the airlines investment in new planes and routes.

Globalization of the Commercial Aircraft Industry The industry is rapidly becoming global for the following reasons: There are very few players, but intense competition and very high capital requirements drive the need to maximize volume and tap all possible markets. It is unthinkable to have a national or regional strategy and expect to succeed in this industry. As many customersincluding various governments across the worldconsider the aircraft industry strategic, they want a share of the action. As a consequence, partnerships, joint ventures are aplenty.

In fact such deals, mergers and joint ventures become a must in order to remove trade barriers. Importance of I/T to the Industry I/Ts importance to the industry can be evaluated from two different Operations management, such as in inventory management, etc. I/T is key to optimize resources, reduce costs, improve efficiencies. As an extremely high technology and complex industry, integrating electronics, mechanics, chemicals, metallurgy, etc.

CAD/CAM tools used in simulation, modeling, concurrent engineering are not only key in reducing time to market but also a must in the industrys ability to cope with the complexity of the task. As it can be observed from the value chain (figure 3, page 13), I/T intervenes in almost every phase of Boeings operations. Its role is most significant in inbound logistics, operations and service. These are the steps of the value chain where Boeing uses I/T to gain a competitive advantage. I/Ts presence in the other segments is not negligible either, but its value is limited to a more traditional Boeing has three business units: Commercial Jet Aircraft (President: Ron Woodward): By far the largest, this unit designs, develops and manufactures commercial jet aircraft.

It has a very comprehensive product portfolio ranging from the 737 series with seating capacity from about 100 to 150 passengers, to the 747 with seating capacity from 420 to 566 passengers.

Other models are the twinjets Boeing 767 (long range, 210 to 325 passengers) and the 757 (mid-range, 180 to 230 passengers). The company introduced in 1993 its newest model, the Boeing 777 with seating capacity of 305 to 440 passengers and the first to be 100 percent equipped with fly-by-wire technology. Boeing also plans to renew its 737 line with the next generation 737-700 which is scheduled for delivery in 1997. Boeings commercial aircraft sales amounted to $20, 568 million in 1993.

Defense and Space (President: Jerry King): Despite the strong decline in the U. S. Defense projects and Boeings declining sales in this domain, the company had sales of $4, 742 million defense business with an operating profit of $303 million. Major contributors to the defense revenues were Space Station work packages, F-22 fighter aircraft, V-22 Osprey tiltrotor transport and RAH-66 Comanche helicopter.

These programs are principally funded under cost-reimbursement type contracts. Computer Services (President: John Warner): Although this divisions primary mission is to provide cost-efficient computing support for company operations, it generated revenues of $331 million by mainly competing for selected federal contracts to manage information systems. Profits for this group were a slim $2 million, down from $16 million in 1993. However, this groups main mission is to serve the other internal divisions and it is still remarkable that it is more than self sustaining.

The company is based in Seattle. Frank Shrontz is its Chairman and Chief Executive Officer and Philip M. Condit is its President. Market and Financial Performance Highlights of Boeings financial performance for the last five years are summarized in tables 3 and 4; After an all time high of revenues in 1992, Boeing faced a severe downturn, due to the dismal financial performance of most airlines and increased competition from Airbus.

The trend continued in 1994; Boeing closed the fourth quarter with sales of $5, 120 million, down 9% from the previous year, and the overall results in 1994 were $21, 924 million, down 14% from 1993 sales of 1993.

Profitability severely declined also with net earnings of $856 million; -31% compared to last year. 1993 1992 1991 1990 $20, 568 $24, 133 $22, 970 $21, 230 4, 407 5, 429 5, 846 5, 862 463 622 498 503 25, 438 30, 184 29, 314 27, 595 1, 244 1, 554 1, 567 1, 385 3. 66 4. 57 4.

56 4. 01 4. 9% 5. 2% 5.

3% 5. 0% 1, 661 1, 846 1, 417 827 134, 400 148, 600 159, 100 161, 700 Table 3: Summary of Boeings Operations Business Week lists Boeing in Aerospace & Defense category. The average return on common equity in the industry is 13. 1%, while Boeing only achieves 8. 9%. However, Boeing is the least military of its group and this comparison is probably not very fair.

Interestingly enough, McDonnell Douglas, the only other defense company with a significant commercial activity in this group fares quite well with 15. 7% return.

While Boeings defense activity is dwindling, McDonnell Douglas remains strong and probably helps keep it afloat in the commercial aircraft business. Boeings employment figures show great variations and match closely its financial performance. It is expected that Boeing cut its employment by at least 7, 000 jobs in 1995, as the industry doesnt show any strong recovery signs.

1993 1992 1991 1990 20, 450 18, 147 15, 924 14, 591 2, 601 1, 947 2, 462 1, 396 7, 088 6, 724 5, 530 4, 448 3, 108 3, 614 3, 453 3, 326 2, 630 1, 793 1, 317 315 8, 983 8, 056 8, 093 6, 973 $70, 497 $82, 649 $92, 826 $91, 475 Table 4: Boeing Balance Sheet Boeing has a strong balance sheet as of 12/31/94, however, as seen in table 4, there are some negative trends; debt has significantly increased during the last three years. The cash situation remains strong although it has shrunk by nearly $1 billion in the last two years, but new aircraft orders backlog has been steadily shrinking since 1991.

Finally its profitability still follows a negative trend, with net earnings having receded from $1, 244 million in 1993 to In the 1993 annual report, Frank Shrontz says: …

the cornerstone of our business strategy, is continuous improvement in the quality of products and processes. Boeing is committed to continuous improvement, and we are determined to cut waste and boost productivity with the goal of producing higher quality products in less time at the lowest possible cost. It is clear from these lines that Boeing is betting on higher productivity in beating its archrival, Airbus. The underlying assumption here is that Boeing will not be able to outspend Airbus that can always count on government subsidies and friendly national airlines, therefore it must be able to match Airbus Industries lower sale prices and it must be first to the market with innovative and technologically advanced products.

Significance of Information Systems Boeings action plan as outlined by Condit and Shrontz is Slash costs by 25% to 30% by year 2000.

Speed up manufacturing time for the 737 from 13 months to 6 Cut inventory, moving toward a just-in-time system. Train the entire workforce in competitiveness; 15, 000 managers have already completed four-day course. Bring customers and suppliers into the once-secret process of A quick look at the Porter Value Chain model (Figure 3) indicates where and how these efforts will enhance Boeings competitiveness.

Boeing has nearly $8 billion of inventory that turns only twice a year, compared with nearly 10 times a year or higher for world class manufacturers in other industries. And since an aircraft has about 132, 500 engineered parts, plus about three million rivets, screws, etc., it becomes apparent that the management of such an inventory and its procurement with a just-in-time system will not only require world class Information Technology, but it will also need to be closely integrated with its principal suppliers.

On the other hand, the quick development and manufacturing cycles that Boeing has targeted require state of the art CAD/CAM systems that enable the transition from concept to fabrication without costly and time consuming adjustments. Ironicallyand probably quite rightfullyBoeing chose a French CAD tool; Catia, developed by Dassault, a military aircraft manufacturer, designer among others of Figure 3: Porter Value Chain for Boeing Therefore advanced Information Technology tools and their application in both design and development, and operations are critically important to Boeings success in implementing its Strengths and Weaknesses of Boeing We will assess Boeings strengths and weaknesses under the light of its formulated strategy in competing against Airbus.

Boeing doesnt believe that just having the best technology will be enough to conquer the markets, but the final battle will be fought on pricing and financing.

It is therefore key for Boeing to improve its productivity and achieve the lowest possible cost structure and flexibility to beat Airbus, despite its being subsidized. Boeing is already on its way to achieve its goals in productivity, and it is safe to assume that it already has a lower cost structure than Airbus. It has trimmed its workforce to the minimum and it has plans to further cut 7000 jobs this year.