Chapter-1

AVIATION INDUSTRY IN INDIA
: AN OVERVIEW
CHAPTER - I
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1.1. INTRODUCTION

India is one of the fastest growing aviation markets in the world. With the liberalization of the Indian aviation sector, the industry had witnessed a transformation with the entry of the privately owned full service airlines (FSA) and low cost carriers (LCA). The sector also witnessed a significant increase in number of domestic air travel passengers. Some of the factors that have resulted in higher demand for air transport in India include the growing middle class and its purchasing power, low airfares offered by LCA’s, the growth of the tourism industry in India, increasing outbound travel from India and the overall economic growth of India.\(^1\)

After the Indian aviation sector underwent liberalization in late nineties, it has seen a flurry of private service airlines entering the industry. The aviation sector in India holds immense potential for growth; more so because it receives great impetus from the booming tourism industry driven by higher disposable incomes and favorable demographics. The robust policy regime created by the Indian Government acts as the blood line of this industry. While the last few years have witnessed significant investments by large and small domestic companies, indigenous aerospace and defense industry has been evolving in a big way. The Indian aviation sector continues to hold immense potential for growth.\(^2\)

1.2. HISTORY AND GROWTH OF AVIATION INDUSTRY

On December 17, 1903, Orville and Wilbur Wright capped four years of research and design efforts with a 120-foot, 12-second flight at Kitty Hawk, North Carolina - the first powered flight in a heavier-than-air machine. Prior to that, people had flown only in balloons and gliders.
The first person to fly as a passenger was Leon Delagrange, who rode with French pilot Henri Farman from a meadow outside of Paris in 1908. Charles Furnas became the first American airplane passenger when he flew with Orville Wright at Kitty Hawk later that year.

The first scheduled air service began in Florida on January 1, 1914. Glenn Curtiss had designed a plane that could take off and land on water and thus could be built larger than any plane to date, because it did not need the heavy undercarriage required for landing on hard ground. Thomas Benoist, an auto parts maker, decided to build such a flying boat, or seaplane, for a service across Tampa Bay called the St. Petersburg - Tampa Air Boat Line. His first passenger was ex-St. Petersburg Mayor A.C. Pheil, who made the 18-mile trip in 23 minutes, a considerable improvement over the two-hour trip by boat. The single-plane service accommodated one passenger at a time, and the company charged a one-way fare of $5. After operating two flights a day for four months, the company folded with the end of the winter tourist season.

**World War I**: These and other early flights were headline events, but commercial aviation was very slow to catch on with the general public, most of whom were afraid to ride in the new flying machines. Improvements in aircraft design also were slow. However, with the advent of World War I, the military value of aircraft was quickly recognized and production increased significantly to meet the soaring demand for planes from governments on both sides of the Atlantic. Most significant was the development of more powerful motors, enabling aircraft to reach speeds of up to 130 miles per hour, more than twice the speed of pre-war aircraft. Increased power also made larger aircraft possible.
At the same time, the war was bad for commercial aviation in several respects. It focused all design and production efforts on building military aircraft. In the public's mind, flying became associated with bombing runs, surveillance and aerial dogfights. In addition, there was such a large surplus of planes at the end of the war that the demand for new production was almost nonexistent for several years - and many aircraft builders went bankrupt. Some European countries, such as Great Britain and France, nurtured commercial aviation by starting air service over the English Channel. However, nothing similar occurred in the United States, where there were no such natural obstacles isolating major cities and where railroads could transport people almost as fast as an airplane, and in considerably more comfort. The salvation of the U.S. commercial aviation industry following World War I was a government program, but one that had nothing to do with the transportation of people.

**Airmail**: By 1917, the U.S. government felt enough progress had been made in the development of planes to warrant something totally new - the transport of mail by air. That year, Congress appropriated $100,000 for an experimental airmail service to be conducted jointly by the Army and the Post Office between Washington and New York, with an intermediate stop in Philadelphia. The first flight left Belmont Park, Long Island for Philadelphia on May 14, 1918 and the next day continued on to Washington, where it was met by President Woodrow Wilson.

With a large number of war-surplus aircraft in hand, the Post Office set its sights on a far more ambitious goal - transcontinental air service. It opened the first segment, between Chicago and Cleveland, on May 15, 1919 and completed the air route on September 8, 1920, when the most difficult part of the route, the Rocky Mountains, was spanned. Airplanes still could not fly at night when the service first began, so the mail was handed off to trains at the end of each day.
Nonetheless, by using airplanes the Post Office was able to shave 22 hours off coast-to-coast mail deliveries.

**Beacons:** In 1921, the Army deployed rotating beacons in a line between Columbus and Dayton, Ohio, a distance of about 80 miles. The beacons, visible to pilots at 10-second intervals, made it possible to fly the route at night.

The Post Office took over the operation of the guidance system the following year, and by the end of 1923, constructed similar beacons between Chicago and Cheyenne, Wyoming, a line later extended coast-to-coast at a cost of $550,000. Mail then could be delivered across the continent in as little as 29 hours eastbound and 34 hours westbound - prevailing winds from west to east accounted for the difference which was at least two days less than it took by train.

**The Contract Air Mail Act of 1925:** By the mid-1920s, the Post Office mail fleet was flying 2.5 million miles and delivering 14 million letters annually. However, the government had no intention of continuing airmail service on its own. Traditionally, the Post Office had used private companies for the transportation of mail. So, once the feasibility of airmail was firmly established and airline facilities were in place, the government moved to transfer airmail service to the private sector, by way of competitive bids. The legislative authority for the move was the Contract Air Mail Act of 1925, commonly referred to as the Kelly Act after its chief sponsor, Rep. Clyde Kelly of Pennsylvania. This was the first major step toward the creation of a private U.S. airline industry. Winners of the initial five contracts were National Air Transport (owned by the Curtiss Aero plane Co.), Varney Air Lines, Western Air Express, Colonial Air Transport and Robertson Aircraft Corporation. National and Varney would later become important parts of United Air Lines (originally a joint venture of the Boeing Airplane Company and Pratt &
Whitney). Western would merge with Transcontinental Air Transport (TAT), another Curtiss subsidiary, to form Transcontinental and Western Air (TWA). Robertson would become part of the Universal Aviation Corporation, which in turn would merge with Colonial, Southern Air Transport and others, to form American Airways, predecessor of American Airlines. Juan Trippe, one of the original partners in Colonial, later pioneered international air travel with Pan Am - a carrier he founded in 1927 to transport mail between Key West, Florida, and Havana, Cuba. Pitcairn Aviation, yet another Curtiss subsidiary that got its start transporting mail, would become Eastern Air Transport, predecessor of Eastern Air Lines.

The Morrow Board: The same year Congress passed the Contract Air Mail Act, President Calvin Coolidge appointed a board to recommend a national aviation policy (a much-sought-after goal of then Secretary of Commerce Herbert Hoover). Dwight Morrow, a senior partner in J.P. Morgan's bank, and later the father-in-law of Charles Lindbergh, was named chairman. The board heard testimony from 99 people, and on November 30, 1925, submitted its report to President Coolidge. The report was wide-ranging, but its key recommendation was that the government should set standards for civil aviation and that the standards should be set outside of the military.

The Air Commerce Act of 1926: Congress adopted the recommendations of the Morrow Board almost to the letter in the Air Commerce Act of 1926. The legislation authorized the Secretary of Commerce to designate air routes, to develop air navigation systems, to license pilots and aircraft, and to investigate accidents. The act brought the government into commercial aviation as regulator of the private airlines spawned by the Kelly Act of the previous year.
Congress also adopted the board's recommendation for airmail contracting, by amending the Kelly Act to change the method of compensation for airmail services. Instead of paying carriers a percentage of the postage paid, the government would pay them according to the weight of the mail. This simplified payments, and proved highly advantageous to the carriers, which collected $48 million from the government for the carriage of mail between 1926 and 1931.

**Ford's Tin Goose** : Henry Ford, the automobile manufacturer, was also among the early successful bidders for airmail contracts, winning the right, in 1925, to carry mail from Chicago to Detroit and Cleveland aboard planes his company already was using to transport spare parts for his automobile assembly plants. More importantly, he jumped into aircraft manufacturing, and in 1927, produced the Ford Trimotor, commonly referred to as the Tin Goose. It was one of the first all-metal planes, made of a new material, duralumin, which was almost as light as aluminum but twice as strong. It also was the first plane designed primarily to carry passengers rather than mail. The Ford Trimotor had 12 passenger seats; a cabin high enough for a passenger to walk down the aisle without stooping; and room for a "stewardess," or flight attendant, the first of whom were nurses, hired by United in 1930 to serve meals and assist airsick passengers. The Tin Goose's three engines made it possible to fly higher and faster (up to 130 miles per hour), and its sturdy appearance, combined with the Ford name, had a reassuring effect on the public's perception of flying. However, it was another event, in 1927, that brought unprecedented public attention to aviation and helped secure the industry's future as a major mode of transportation.

**Charles Lindbergh** : At 7:52 a.m. on May 20, 1927, a young pilot named Charles Lindbergh set out on an historic flight across the Atlantic Ocean, from New York to Paris. It was the first trans-Atlantic non-stop flight in an airplane, and its effect on both Lindbergh and aviation was
enormous. Lindbergh became an instant American hero. Aviation became a more established industry, attracting millions of private investment dollars almost overnight, as well as the support of millions of Americans.

The pilot who sparked all of this attention had dropped out of engineering school at the University of Wisconsin to learn how to fly. He became a barnstormer, doing aerial shows across the country, and eventually joined the Robertson Aircraft Corporation, to transport mail between St. Louis and Chicago.

In planning his trans-Atlantic voyage, Lindbergh daringly decided to fly by himself, without a navigator, so he could carry more fuel. His plane, the Spirit of St. Louis, was slightly less than 28 feet in length, with a wingspan of 46 feet. It carried 450 gallons of gasoline, which comprised half its takeoff weight. There was too little room in the cramped cockpit for navigating by the stars, so Lindbergh flew by dead reckoning. He divided maps from his local library into thirty-three 100-mile segments, noting the heading he would follow as he flew each segment. When he first sighted the coast of Ireland, he was almost exactly on the route he had plotted, and he landed several hours later, with 80 gallons of fuel to spare.

Lindbergh's greatest enemy on his journey was fatigue. The trip took an exhausting 33 hours, 29 minutes and 30 seconds, but he managed to keep awake by sticking his head out the window to inhale cold air, by holding his eyelids open, and by constantly reminding himself that if he fell asleep he would perish. In addition, he had a slight instability built into his airplane that helped keep him focused and awake.
Lindbergh landed at Le Bourget Field, outside of Paris, at 10:24 p.m. Paris time on May 21. Word of his flight preceded him and a large crowd of Parisians rushed out to the airfield to see him and his little plane. There was no question about the magnitude of what he had accomplished. The Air Age had arrived.

**The Watres Act and the Spoils Conference**: In 1930, Postmaster General Walter Brown pushed for legislation that would have another major impact on the development of commercial aviation. Known as the Watres Act (after one of its chief sponsors, Rep. Laurence H. Watres of Pennsylvania), it authorized the Post Office to enter into longer-term contracts for airmail, with rates based on space or volume, rather than weight. In addition, the act authorized the Post Office to consolidate airmail routes, where it was in the national interest to do so. Brown believed the changes would promote larger, stronger airlines, as well as more coast-to-coast and nighttime service.

Immediately after Congress approved the act, Brown held a series of meetings in Washington to discuss the new contracts. The meetings were later dubbed the Spoils Conference because Brown gave them little publicity and directly invited only a handful of people from the larger airlines. He designated three transcontinental mail routes and made it clear that he wanted only one company operating each service rather than a number of small airlines handing the mail off to one another. His actions brought political trouble that resulted in major changes to the system two years later.

**Scandal and the Air Mail Act of 1934**: Following the Democratic landslide in the election of 1932, some of the smaller airlines began complaining to news reporters and politicians that they had been unfairly denied airmail contracts by Brown. One reporter discovered that a major
contract had been awarded to an airline whose bid was three times higher than a rival bid from a smaller airline. Congressional hearings followed, chaired by Sen. Hugo Black of Alabama, and by 1934 the scandal had reached such proportions as to prompt President Franklin Roosevelt to cancel all mail contracts and turn mail deliveries over to the Army.

The decision was a mistake. The Army pilots were unfamiliar with the mail routes, and the weather at the time they took over the deliveries, February 1934, was terrible. There were a number of accidents as the pilots flew practice runs and began carrying the mail, leading to newspaper headlines that forced President Roosevelt to retreat from his plan only a month after he had turned the mail over to the Army.

By means of the Air Mail Act of 1934, the government once again returned airmail transportation to the private sector, but it did so under a new set of rules that would have a significant impact on the industry. Bidding was structured to be more competitive, and former contract holders were not allowed to bid at all, so many companies were reorganized. The result was a more even distribution of the government's mail business and lower mail rates that forced airlines and aircraft manufacturers to pay more attention to the development of the passenger side of the business.

In another major change, the government forced the dismantling of the vertical holding companies common up to that time in the industry, sending aircraft manufacturers and airline operators (most notably Boeing, Pratt & Whitney, and United Air Lines) their separate ways. The entire industry was now reorganized and refocused.

**Aircraft Innovations:** For the airlines to attract passengers away from the railroads, they needed both larger and faster airplanes. They also needed safer airplanes. Accidents, such as the one in
1931 that killed Notre Dame Football Coach Knute Rockne along with six others, kept people from flying.

Aircraft manufacturers responded to the challenge. There were so many improvements to aircraft in the 1930s that many believe it was the most innovative period in aviation history. Air-cooled engines replaced water-cooled engines, reducing weight and making larger and faster planes possible. Cockpit instruments also improved, with better altimeters, airspeed indicators, rate-of-climb indicators, compasses, and the introduction of artificial horizon, which showed pilots the attitude of the aircraft relative to the ground - important for flying in reduced visibility.

**Radio:** Another development of enormous importance to aviation was radio. Aviation and radio developed almost in lock step. Marconi sent his first message across the Atlantic on the airwaves just two years before the Wright Brothers’ First flight at Kitty Hawk. By World War I, some pilots were taking radios up in the air with them so they could communicate with people on the ground. The airlines followed suit after the war, using radio to transmit weather information from the ground to their pilots, so they could avoid storms.

An even more significant development, however, was the realization that radio could be used as an aid to navigation when visibility was poor and visual navigation aids, such as beacons, were useless. Once technical problems were worked out, the Department of Commerce constructed 83 radio beacons across the country. They became fully operational in 1932, automatically transmitting directional beams, or tracks, that pilots could follow to their destination. Marker beacons came next, allowing pilots to locate airports in poor visibility. The first air traffic control tower was established in 1935 at what is now Newark International Airport in New Jersey.
The First Modern Airliners: Boeing built what generally is considered the first modern passenger airliner, the Boeing 247. It was unveiled in 1933, and United Air Lines promptly bought 60 of them. Based on a low-wing, twin-engine bomber with retractable landing gear built for the military, the 247 accommodated 10 passengers and cruised at 155 miles per hour. Its cabin was insulated, to reduce engine noise levels inside the plane, and it featured such amenities as upholstered seats and a hot water heater to make flying more comfortable to passengers. Eventually, Boeing also gave the 247 variable-pitch propellers, which reduced takeoff distances, increased the rate of climb, and boosted cruising speeds.

Not to be outdone by United, TWA went searching for an alternative to the 247 and eventually found what it wanted from the Douglas Aircraft Company. Its DC-1 incorporated Boeing’s innovations and improved upon many of them. The DC-1 had a more powerful engine and accommodations for two more passengers than did the 247. More importantly, the airframe was designed so that the skin of the aircraft bore most of the stress on the plane during flight. There was no interior skeleton of metal spars, thus giving passengers more room than they had in the 247. The DC-1 also was easier to fly. It was equipped with the first automatic pilot and the first efficient wing flaps, for added lift during takeoff. However, for all its advancements, only one DC-1 was ever built. Douglas decided almost immediately to alter its design, adding 18 inches to its length so it could accommodate two more passengers. The new, longer version was called the DC-2 and it was a big success, but the best was still to come.

The DC-3: Called the plane that changed the world, the DC-3 was the first aircraft to enable airlines to make money carrying passengers. As a result, it quickly became the dominant aircraft
in the United States, following its debut in 1936 with American Airlines (which played a key role in its design).

The DC-3 had 50 percent greater passenger capacity than the DC-2 (21 seats versus 14), yet cost only ten percent more to operate. It also was considered a safer plane, built of an aluminum alloy stronger than materials previously used in aircraft construction. It had more powerful engines (1,000 horsepower versus 710 horsepower for the DC-2), and it could travel coast to coast in only 16 hours - a fast trip for that time.

Another important improvement was the use of a hydraulic pump to lower and raise the landing gear. This freed pilots from having to crank the gear up and down during takeoffs and landings. For greater passenger comfort, the DC-3 had a noise-deadening plastic insulation, and seats set in rubber to minimize vibrations. It was a fantastically popular airplane, and it helped attract many new travelers to flying⁹.

**Pressurized Cabins:** Although planes such as the Boeing 247 and the DC-3 represented significant advances in aircraft design, they had a major drawback. They could fly no higher than 10,000 feet, because people became dizzy and even fainted, due to the reduced levels of oxygen at higher altitudes. The airlines wanted to fly higher, to get above the air turbulence and storms common at lower altitudes. Motion sickness was a problem for many airline passengers, and an inhibiting factor to the industry's growth.

The breakthrough came at Boeing with the Stratoliner, a derivation of the B-17 bomber introduced in 1940 and first flown by TWA. It was the first pressurized aircraft, meaning that air was pumped into the aircraft as it gained altitude to maintain an atmosphere inside the cabin similar to the atmosphere that occurs naturally at lower altitudes. With its regulated air
compressor, the 33-seat Stratoliner could fly as high as 20,000 feet and reach speeds of 200 miles
per hour.

The Civil Aeronautics Act of 1938: Government decisions continued to prove as important to
aviation's future as technological breakthroughs, and one of the most important aviation bills
ever enacted by Congress was the Civil Aeronautics Act of 1938. Until that time, numerous
government agencies and departments had a hand in aviation policy. Airlines sometimes were
pushed and pulled in several directions, and there was no central agency working for the long-
term development of the industry. All the airlines had been losing money, since the postal
reforms in 1934 significantly reduced the amount they were paid for carrying the mail.10

The airlines wanted more rationalized government regulation, through an independent
agency, and the Civil Aeronautics Act gave them what they needed. It created the Civil
Aeronautics Authority (CAA) and gave the new agency power to regulate airline fares, airmail
rates, interline agreements, mergers and routes. Its mission was to preserve order in the industry,
holding rates to reasonable levels while, at the same time nurturing the still financially-shaky
airline industry, thereby encouraging the development of commercial air transportation.

Congress created a separate agency - the Air Safety Board - to investigate accidents. In
1940, however, President Roosevelt convinced Congress to transfer the accident investigation
function to the CAA, which was then renamed the Civil Aeronautics Board (CAB). These
moves, coupled with the tremendous progress made on the technological side, put the industry on
the road to success.

World War II: Aviation had an enormous impact on the course of World War II and the war
had just as significant an impact on aviation. There were fewer than 300 air transport aircraft in
the United States when Hitler marched into Poland in 1939. By the end of the war, U.S. aircraft manufacturers were producing 50,000 planes a year.

Most of the planes, of course, were fighters and bombers, but the importance of air transports to the war effort quickly became apparent as well. Throughout the war, the airlines provided much needed airlift to keep troops and supplies moving, to the front and throughout the production chain back home. For the first time in their history, the airlines had far more business - for passengers as well as freight - than they could handle. Many of them also had opportunities to pioneer new routes, gaining an exposure that would give them a decidedly broader outlook at war's end.

While there were numerous advances in U.S. aircraft design during the war, that enabled planes to go faster, higher, and farther than ever before, mass production was the chief goal of the United States. The major innovations of the wartime period - radar and jet engines - occurred in Europe.

The Jet Engine: Isaac Newton was the first to theorize, in the 18th century, that a rearward-channeled explosion could propel a machine forward at a great rate of speed. However, no one found a practical application for the theory until Frank Whittle, a British pilot, designed the first jet engine in 1930. Even then, widespread skepticism about the commercial viability of a jet prevented Whittle's design from being tested for several years.

The Germans were the first to build and test a jet aircraft. Based on a design by Hans von Ohain, a student whose work was independent of Whittle's, it flew in 1939, although not as well as the Germans had hoped. It would take another five years for German scientists to perfect the design, by which time it was, fortunately, too late to affect the outcome of the war.
Whittle also improved his jet engine during the war, and in 1942 he shipped an engine prototype to General Electric in the United States. America's first jet plane - the Bell P-59 - was built the following year.

**Radar:** Another technological development with a much greater impact on the war's outcome (and later on commercial aviation) was radar. British scientists had been working on a device that could give them early warning of approaching enemy aircraft even before the war began, and by 1940 Britain had a line of radar transceivers along its east coast that could detect German aircraft the moment they took off from the Continent. British scientists also perfected the cathode ray oscilloscope, which produced map-type outlines of surrounding countryside and showed aircraft as a pulsing light. Americans, meanwhile, found a way to distinguish between enemy aircraft and allied aircraft by installing transponders aboard the latter that signaled their identity to radar operators.\(^\text{11}\).

**Dawn of the Jet Age:** Aviation was poised to advance rapidly following the war, in large part because of the development of jets, but there still were significant problems to overcome. In 1952, a 36-seat British-made jet, the Comet, flew from London to Johannesburg, South Africa, at speeds as high as 500 miles per hour. Two years later, the Comet's career ended abruptly following two back-to-back accidents in which the fuselage burst apart during flight - the result of metal fatigue.

The Cold War between the Soviet Union and the United States, following World War II, helped secure the funding needed to solve such problems and advance the jet's development. Most of the breakthroughs related to military aircraft that later were applied to the commercial sector. For example, Boeing employed a swept-back wing design for its B-47 and B-52 bombers
to reduce drag and increase speed. Later, the design was incorporated into commercial jets, making them faster and thus more attractive to passengers. The best example of military-civilian technology transfer was the jet tanker Boeing designed for the Air Force to refuel bombers in flight. The tanker, the KC-135, was a huge success as a military plane, but even more successful when revamped and introduced, in 1958, as the first U.S. passenger jet, the Boeing 707. With a length of 125 feet and four engines with 17,000 pounds of thrust each, the 707 could carry up to 181 passengers and travel at speeds of 550 miles per hour. Its engines proved more reliable than piston-driven engines - producing less vibration, putting less stress on the plane's airframe and reducing maintenance expenses. They also burned kerosene, which cost half as much as the high-octane gasoline used in more traditional planes. With the 707, first ordered and operated by Pan Am, all questions about the commercial feasibility of jets were answered. The Jet Age had arrived, and other airlines soon were lining up to buy the new aircraft.

The Federal Aviation Act of 1958: Following World War II, air travel soared, but with the industry's growth came new problems. In 1956 two aircraft collided over the Grand Canyon, killing 128 people. The skies were getting too crowded for existing systems of aircraft separation, and Congress responded by passing the Federal Aviation Act of 1958.

The legislation created a new safety regulatory agency, the Federal Aviation Agency, later called the Federal Aviation Administration (FAA) when Congress created the Department of Transportation (DOT) in 1967. The agency was charged with establishing and running a broad air traffic control system, to maintain safe separation of all commercial aircraft through all phases of flight. In addition, it assumed jurisdiction over all other aviation safety matters, such as the certification of aircraft designs, and airline training and maintenance programs. The Civil Aeronautics Board retained jurisdiction over economic matters, such as airline routes and rates.
Wide-bodies and Supersonics: 1969 marked the debut of another revolutionary aircraft, the Boeing 747, which, again, Pan Am was the first to purchase and fly in commercial service. It was the first wide-body jet, with two aisles, a distinctive upper deck over the front section of the fuselage, and four engines. With seating for as many as 450 passengers, it was twice as big as any other Boeing jet and 80 percent bigger than the largest jet up until that time, the DC-8.

Recognizing the economies of scale to be gained from larger jets, other aircraft manufacturers quickly followed suit. Douglas built its first wide-body, the DC-10, in 1970, and only a month later, Lockheed flew its contender in the wide-body market, the L-1011. Both of these jets had three engines (one under each wing and one on the tail) and were smaller than the 747, seating about 250 passengers. During the same period of time, efforts were underway in both the United States and Europe to build a supersonic commercial aircraft. The Soviet Union was the first to succeed, testing the Tupolev 144 in December of 1968. A consortium of West European aircraft manufacturers first flew the Concorde two months later and eventually produced a number of those fast, but small, jets for commercial service. U.S. efforts to produce a supersonic passenger jet, on the other hand, stalled in 1971 due to public concern about its expense and the sonic boom produced by such aircraft.

The history of developed economies both in the West and the East has shown that “low-cost” air connectivity is fundamental to rapid economic development. The new phenomenon in India is Low cost airlines. With just one airline in 2004, now there are five low cost airliners operating to various destinations across India. Gone are the days when flying means only to metros, now these low cost airlines connect smaller cities and towns. This means the segment of population which had the power to fly but did not due to lack of flights from their region are now utilizing the services of these low cost airlines.
A battle royal has started in the aviation sector with the sky getting overcrowded. Just before the privatization of the sector, there was only one player – Indian airlines, the sky was literally empty and runways were clear. But of late there has been a steep rise in the number of players. While Jet Airways gave a tough fight to Indian airlines, Sahara joined the fray, giving a more competitive edge to the situation. But with the entry of low-cost carriers like Air Deccan, SpiceJet, and Go Airlines on the scene, a cut-throat competition is bound to be the order of the day. The year 2007 was of consolidation. Jet Airways took over Air Sahara, Kingfisher acquired Air Deccan, and Air India and Indian Airlines announced their merger.

India is one of the fastest growing aviation markets in the world. With the liberalization of the Indian aviation sector, the industry had witnessed a transformation with the entry of the privately owned full service airlines (FSA) and low cost carriers (LCA). In the year 2006, private carriers accounted for around 75% share of the domestic aviation market. The sector also witnessed a significant increase in number of domestic air travel passengers. Some of the factors that have resulted in higher demand for air transport in India include the growing middle class and its purchasing power, booming IT and Real Estate industry, low airfares offered by LCA’s, the growth of the tourism industry in India, increasing outbound travel from India and the overall economic growth of India.

The Indian aviation industry has seen a rapid transition in the number of players. From being a fragmented industry with ten players competing neck-to-neck with each other, now the industry is left with only three big players.

1.3. LOW-COST AIRLINES IN INDIA

In 1994, the Civil Aviation Ministry liberalized the aviation sector and several airlines started up. Some, like East-West, even grabbed a significant amount of market share, but most collapsed within 24 months.

Table 1.1: Airlines in the Aviation Sector
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<th>The ones that died</th>
<th>Those that survived</th>
<th>The present players</th>
<th>Year of launch</th>
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<tr>
<td>East-West Airlines</td>
<td>Jet Airways</td>
<td>Indian Airlines</td>
<td>1953</td>
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<tr>
<td>Damania Airlines</td>
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<td>Jet Airways</td>
<td>1993</td>
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<tr>
<td>ModiLuft</td>
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<td>Kingfisher</td>
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<td>Indigo</td>
<td>2006</td>
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Source: Websites

The main reasons for the deregulation were the decline in profitability of Air India and Indian Airlines owing to organizational and managerial inefficiencies and that the capacity of the national carriers was not enough to meet growing passenger demand. With the enactment of the 1994 Act, private operators were allowed to operate both scheduled and non-scheduled services in the domestic sector and there were no major restrictions on aircraft size and type. During the last three years two of the existing private scheduled domestic operators Jet Airways and Air Sahara were permitted to operate to foreign destinations and six new airlines were permitted to start operations in the domestic sector: Kingfisher, Spicejet, Go-Air, Paramount, Indigo and Indus. The Indian government decided to merge Air India and Indian Airlines to improve operational efficiency. The new entrants have cornered 44% of Indian aviation market and made considerable dent in the market share of erstwhile operators: Indian Airlines, Jet Airways and Sahara airlines, and LCC’s constitute 34% of market.\(^{14}\)

**Air Deccan**

Captain Gopinath, the founder of Air Deccan, is the pioneer of budget airlines in India. He started with the dream of bringing air travel within the reach of the common man and in 2003, Deccan became the first low-cost airline to fly pan-India. It is also the first airline to fly to second tier cities like Hubli, Madurai and Visakhapatnam from major cities like Bangalore and Chennai. Deccan changed the aviation
landscape in the country. With its recent merger with Vijay Mallya's Kingfisher Airlines, Air Deccan was
renamed Deccan, with SimpliFly as its tagline. Subsequently, it changed into kingfisher Red.

New business model

The business model of an LCC broadly includes the following features: a single passenger class; a single type of aircraft for lesser maintenance and servicing costs; flying to cheaper, less congested secondary airports; flying early in the morning or late in the evening to avoid air traffic delays and take advantage of lower landing fees; short flights and fast turnaround times; emphasis on direct sales of tickets, especially over the Internet, hence avoiding agent commissions; employees working in multiple roles; optional paid-for in-flight food and drink; aggressive fuel hedging programmes; and segregation of ancillary charges.

The factors that contributed to enormous growth of LCCs are: (i) Low Entry barrier; (ii) Attraction of Foreign Shores; (iii) Increased permitted Foreign Equity; and (iv) Rising income levels and demographic profile, have contributed significantly to the unprecedented growth of LCC’s in India. India has a population of 1.1 billion of which the middle income group constitutes around 400 million, which is more than the population of USA and that of EU countries. 15 million people travel by train of which around 700,000 people travel in air condition (AC) coaches. There does not exist much price difference between travel by AC and travel by LCC. Within 3 years of operations in India, LCC’s have taken the domestic market share of 49% and the factors contributing for such unprecedented market capitalization are: (i) Highest load efficiency; (ii) Flies to destinations in the Hinterland; (iii) A Lean-and-Mean approach to staffing; (iv) Expansion of operations; (v) Successfully targeted the increasing middle class population of India. The growth of LCCs in India could be attributed to the recent
reforms in Indian aviation industry and also the instantaneous acceptance of air travel when it was provided at rail travel rates. The low-cost carriers are JetLite, Indigo and GoAir\textsuperscript{15}.

1.4. LOW COST STRUCTURE

The LCC business model is based on low cost for both the airline and the consumers. LCCs offer low fares by eliminating many ‘frills’ that do not contribute to the experience of travel but help lower the operating cost structure. An LCC normally has a single passenger class, a single type of airplane, focuses on direct distribution of tickets and dynamic fares (fares that increase as seats get filled up) that reward early reservations. It is important to deploy new and reliable aircraft with high utilization, faster turnaround of the aircraft, simplified routes emphasizing on point to point transit instead of transfer at hubs.

Given the size and terrain of India, air travel is far more time saving than surface transport. A journey of two hours by air is equivalent to anywhere between 18-36 hours by trains. This time advantage coupled with affordable fares offered by LCCs has pushed the demand for air travel like never before. Now people can travel on short weekends which would have been impossible due to long surface transport duration.

The Indian aviation sector was exposed to intense competition with the advent of a low-cost airline -Air Deccan back in 2003. The success of Air Deccan spurred the entry of other LCCs like SpiceJet, Indigo, Go Air and subsequently low fare offerings from Jet airways and Kingfisher airlines. As a result, the sector which was completely dominated by full-service airlines till a decade ago is now dominated by low-cost airlines. However, longer term viability of LCCs models in India remains to be seen (Kingfisher exited the segment recently) as airport charges are same for FSCs and LCCs in India\textsuperscript{16}.

Besides, the fuel costs forms a larger proportion of overall costs as compared to international standards due to higher central and state government levies (viability of direct ATF imports remains to be
seen due to lack of supporting infrastructure) and high congestion at major airports (half an hour hovering at major airport could increase fuel costs by Rs.60,000 to Rs. 115,000 depending on aircraft, besides impacting aircraft utilizations). These constraint can be resolved only if there significant improvement in infrastructure such that LCCs could operate on secondary airports.

Table 1.2: Number of domestic passengers (in lakhs) for Nov’ 15

<table>
<thead>
<tr>
<th>Name of the Airlines</th>
<th>No. of passengers (in lakhs)</th>
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<tr>
<td>Air India</td>
<td>10.38</td>
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<tr>
<td>Jet Airways</td>
<td>9.17</td>
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<tr>
<td>Jet Lite</td>
<td>3.45</td>
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<tr>
<td>Indigo</td>
<td>13.69</td>
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<tr>
<td>SpiceJet</td>
<td>9.78</td>
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<tr>
<td>Go Air</td>
<td>3.73</td>
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</table>

Source: Websites

The civil aviation sector has made significant strides in coping with the growth of international and domestic traffic. It is now increasingly recognized that aviation, far from being a mere mode of transportation for a small elite group, makes an important contribution to the national economy and is crucial for sustainable development of trade and tourism. Domestic air services are provided by Indian
Airlines Ltd. and private airlines (scheduled and non-scheduled). International air services are handled by Air India Ltd.

Indian airlines are now allowed to launch overseas operations only after they serve the domestic market for five years. The Indian aviation industry has seen a rapid transition in the number of players. From being a fragmented industry with ten players competing neck-to-neck with each other, now the industry is left with only three big players.

Paramount Airways, a smaller regional player, is also said to be interested in buying out the Wadia-owned Go Air, which too is a national LCC. Though there are some concerns that continuing fleet additions by most players may lead to a situation of supply outstripping demand -- supply is expected to grow at 22-25 per cent while passenger traffic is expected to grow at 20 per cent -- with fewer players in the fray, competition will be healthier.

The Airport Authority of India (AAI) manages total 122 airports in the country, which include 11 international airports, 94 domestic airports and 28 civil enclaves. Top 5 airports in the country handle 70% of the passenger traffic of which Delhi and Mumbai together account for more than 50%.

The main reasons for the deregulation were the decline in profitability of Air India and Indian Airlines owing to organizational and managerial inefficiencies and that the capacity of the national carriers was not enough to meet growing passenger demand. With the enactment of the 1994 Act, private operators were allowed to operate both scheduled and non-scheduled services in the domestic sector and there were no major restrictions on aircraft size and type. During the last three years two of the existing private scheduled domestic operators Jet Airways and Air Sahara were permitted to operate to foreign destinations and six new airlines were permitted to start operations in the domestic sector: SpiceJet, Go Air, Paramount, Indigo and Indus. The Indian government decided to merge Air India and Indian Airlines to improve operational efficiency 27%. The new entrants have cornered 44% of Indian aviation market.
and made considerable dent in the market share of erstwhile operators: Indian Airlines, Jet Airways and Sahara airlines, and LCC’s constitute 34% of market.

Table 1.3: Growth of Airlines

<table>
<thead>
<tr>
<th>Airline</th>
<th>Year of launch</th>
<th>Net profit</th>
<th>Market share</th>
<th>Fleet size</th>
<th>Strategy</th>
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<tr>
<td>Air India</td>
<td>1932</td>
<td>16.24</td>
<td>NA</td>
<td>53</td>
<td>FSC</td>
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<td>Indian Airlines</td>
<td>1953</td>
<td>57.2</td>
<td>17.9</td>
<td>75</td>
<td>FSC</td>
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<td>Jet Airways</td>
<td>1993</td>
<td>27.94</td>
<td>34</td>
<td>64</td>
<td>FSC</td>
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<td>Kingfisher</td>
<td>2005</td>
<td>NA</td>
<td>9.8</td>
<td>31</td>
<td>FSC</td>
</tr>
<tr>
<td>Airlines</td>
<td>2005</td>
<td>NA</td>
<td>9.8</td>
<td>31</td>
<td>FSC</td>
</tr>
<tr>
<td>Air Deccan</td>
<td>2003</td>
<td>-246.5</td>
<td>19.8</td>
<td>44</td>
<td>LCC</td>
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<tr>
<td>SpiceJet</td>
<td>2005</td>
<td>-41.4</td>
<td>8.1</td>
<td>9</td>
<td>LCC</td>
</tr>
<tr>
<td>Paramount</td>
<td>2005</td>
<td>NA</td>
<td>1.4</td>
<td>5</td>
<td>Alue carrier</td>
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<tr>
<td>Go Air</td>
<td>2005</td>
<td>NA</td>
<td>4.8</td>
<td>5</td>
<td>LCC</td>
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<tr>
<td>IndiGo</td>
<td>2006</td>
<td>NA</td>
<td>4.2</td>
<td>11</td>
<td>LCC</td>
</tr>
</tbody>
</table>

Source: Websites

The liberalization of the skies happened in 1994 when the Air Corporation Act, 1953 was repealed. A number of private airlines started domestic operations in India. Prominent among them were East West Airlines, Jagsons Airlines, Continental Aviation, and Damania Airways. In 1995, six private airlines accounted for more than 10 per cent of domestic air traffic. As demand contracted in the subsequent years, vicious fare battles made many of them close shop. Jet and Sahara survived. The Tata Group’s valiant attempts at a joint venture with Singapore Airlines remained grounded.

Air travel remains a large and growing industry. It facilitates economic growth, world trade, international investment and tourism and is therefore central to the globalization taking place in many other industries17.
In the past decade, air travel has grown by 7% per year. Travel for both business and leisure purposes grew strongly worldwide. Scheduled airlines carried 1.5 billion passengers last year. In the leisure market, the availability of large aircraft such as the Boeing 747 made it convenient and affordable for people to travel further to new and exotic destinations. Governments in developing countries realized the benefits of tourism to their national economies and spurred the development of resorts and infrastructure to lure tourists from the prosperous countries in Western Europe and North America. As the economies of developing countries grow, their own citizens are already becoming the new international tourists of the future\textsuperscript{18}.

Business travel has also grown as companies become increasingly international in terms of their investments, their supply and production chains and their customers. The rapid growth of world trade in goods and services and international direct investment have also contributed to growth in business travel.

An airline is a company that provides air transport services for traveling passengers and freight. Airlines lease or own their aircraft with which to supply these services and may form partnerships or alliances with other airlines for mutual benefit. Generally, airline companies are recognized with an air operating certificate or license issued by a governmental aviation body.

Airlines vary from those with a single aircraft carrying mail or cargo, through full-service international airlines operating hundreds of aircraft. Airline services can be categorized as being intercontinental, domestic, regional, or international, and may be operated as scheduled services or charters\textsuperscript{19}.

Worldwide, IATA, International Air Transport Association (IATA), forecasts international air travel Worldwide to grow by an average 6.6% a year to the end of the decade.
and over 5% a year from 2010 to 2020. These rates are similar to those of the past ten years. In Europe and North America, where the air travel market is already highly developed, slower growth of 4%-6% is expected. The most dynamic growth is centered on the Asia/Pacific region, where fast-growing trade and investment are coupled with rising domestic prosperity. Air travel for the region has been rising by up to 9% a year and is forecast to continue to grow rapidly, although the Asian financial crisis in 1997 and 1998 will put the brakes on growth for a year or two. In terms of total passenger trips, however, the main air travel markets of the future will continue to be in and between Europe, North America and Asia.

Airlines' profitability is closely tied to economic growth and trade. During the first half of the 1990s, the industry suffered not only from world recession but travel was further depressed by the Gulf War. In 1991 the number of international passengers dropped for the first time. The financial difficulties were exacerbated by airlines over-ordering aircraft in the boom years of the late 1980s, leading to significant excess capacity in the market. IATA's member airlines suffered cumulative net losses of $20.4bn in the years from 1990 to 1994.

Since then, airlines have had to recognize the need for radical change to ensure their survival and prosperity. Many have tried to cut costs aggressively, to reduce capacity growth and to increase load factors. At a time of renewed economic growth, such actions have returned the industry as a whole to profitability: IATA airlines' profits were $5bn in 1996, less than 2% of total revenues. This is below the level IATA believes is necessary for airlines to reduce their debt, build reserves and sustain investment levels. In addition, many airlines remain unprofitable.

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To meet the requirements of their increasingly discerning customers, some airlines have to invest heavily in the quality of service that they offer, both on the ground and in the air. Ticketless travel, new interactive entertainment systems, and more comfortable seating are just some of the product enhancements being introduced to attract and retain customers.

A number of factors are forcing airlines to become more efficient. In Europe, the European Union (EU) has ruled that governments should not be allowed to subsidize their loss-making airlines. Elsewhere too, governments' concerns over their own finances and a recognition of the benefits of privatization have led to a gradual transfer of ownership of airlines from the state to the private sector. In order to appeal to prospective shareholders, the airlines have to become more efficient and competitive.

Deregulation is also stimulating competition, such as that from small, low-cost carriers. The US led the way in 1978 and Europe is following suit. The EU's final stage of deregulation took effect in April 1997, allowing an airline from one member state to fly passengers within another member's domestic market. Beyond Europe too, 'open skies' agreements are beginning to dismantle some of the regulations governing which carriers can fly on certain routes. Nevertheless, the aviation industry is characterized by strong nationalist sentiments towards domestic 'flag carriers'. In many parts of the world, airlines will therefore continue to face limitations on where they can fly and restrictions on their ownership of foreign carriers.

Despite this, the airline industry has proceeded along the path towards globalization and consolidation, characteristics associated with the normal development of many other industries. It has done this through the establishment of alliances and partnerships between airlines, linking
their networks to expand access to their customers. Hundreds of airlines have entered into alliances, ranging from marketing agreements and code-shares to franchises and equity transfers.

The outlook for the air travel industry is one of strong growth. Forecasts suggest that the number of passengers will double by 2010. For airlines, the future will hold many challenges. Successful airlines will be those that continue to tackle their costs and improve their products, thereby securing a strong presence in the key world aviation markets.

Size of the Industry There are about 450 airports and 1091 registered aircrafts in India Today. Geographical distribution Mumbai, Kolkata, Hyderabad, Delhi, Pune, Bangalore, Chennai. Output per annum Growth rate of 18% per annum

History: Indian Aviation Industry is one of the fastest growing airline industries in the world. The history of Indian Aviation Industry started in December 1912 with its first domestic air route between Karachi and Delhi. It was opened by the Indian Air Services in collaboration with the UK based Imperial Airways as an extension of London-Karachi flight of the Imperial Airways. Tata Sons Ltd., the first Indian airline, started a regular airmail service between Karachi and Madras three years later without any backing from the Indian government.

During the period of independence, 9 air transport companies were carrying both air cargo and passengers in the Indian Territory. In 1948, the Indian Government and Air India set up a joint sector company, Air India International to further strengthen the Aviation Industry of India. As part of nationalization in 1953 of Indian Airlines (IA) brought the domestic civil aviation sector under the purview of Indian Government. Later till the mid 1990's government-owned airlines dominated Indian aviation industry. When the government adopted the Open-sky
policy in 1990 and other liberalization policies the Indian Aviation Indian made underwent a rapid and dramatic transformation.

By the year 2000 several private airlines have entered into the aviation business in succession and many more were about to enter into the arena. Indian aviation industry today is dominated by private airlines and low-cost carriers like Deccan Airlines, GoAir, and SpiceJet, etc. And Indian Airlines, the giant of Indian air travel industry, gradually lost its market share to these private airlines. According to the report of CAPA, these budget carriers are likely to double their market share by 2010 -- one of the highest in the world.

Indian Aviation Industry has been one of the fastest-growing aviation industries in the world with private airlines accounting for more than 75% of the sector of the domestic aviation market. With a compound annual growth rate (CAGR) of 18% and 454 airports and airstrips in place in the country, of which 16 are designated as international airports, it has been stated that the aviation sector will witness revival by 2011.

In 2009 with increase in traffic movement and increase in revenues by almost US$ 21.4 million, the Airports Authority of India seems set to accrue better margins in 2009-10, as per the latest estimates released by the Ministry of Civil Aviation.

This is being primarily attributed because of the increase in the share of revenue from Delhi International Airport Limited (DIAL) and Mumbai International Airport Limited (MIAL). Passengers carried by Indian domestic airlines from January-February 2010 stood at 8,056,000 as against 6,761,000 in the corresponding period of 2009-a growth of 19.2%, according to a report released by the Ministry of Civil Aviation.
Today Hyderabad International Airport has been ranked amongst the world's top five in the annual Airport Service Quality (ASQ) passenger survey along with airports at Seoul, Singapore, Hong Kong and Beijing. This airport in Hyderabad is managed by a public-private joint venture consisting of the GMR Group, Malaysia Airports Holdings Berhad and both the State Government of Andhra Pradesh and the Airports Authority of India (AAI).

The Indian aviation sector can be broadly divided into three main categories:

1. **Scheduled air transport service**: It is an air transport service undertaken between two or more places and operated according to a published timetable. It includes: Domestic airlines, which provide scheduled flights within India and to select international destinations. Air Deccan, Spice Jet and IndiGo are some of the domestic players in the industry.

   International airlines operate from scheduled international air services to and from India.

2. **Non-scheduled air transport service**: It is an air transport service other than the scheduled one and may be on charter basis and/or non-scheduled basis. The operator is not permitted to publish time schedule and issue tickets to passengers.

3. **Air cargo services**: It is an air transportation of cargo and mail. It may be on scheduled or non-scheduled basis. These operations are to destinations within India. For operation outside India, the operator has to take specific permission of Directorate General of Civil Aviation demonstrating his capacity for conducting such an operation.

**1.5 SIZE OF THE INDUSTRY**

India is one of the fastest growing aviation markets in the world. A total of 127 airports in the country, which include 13 international airports, 7 custom airports, 80 domestic airports
and 28 civil enclaves are managed by The Airport Authority of India (AAI). There are about 450 airports and 1091 registered aircrafts in India today.

Players in Indian aviation industry can be classified into three groups:

- Public players
- Private players
- Start up players

There are three public players: Air India, Indian Airlines and Alliance Air. The private players include Jet Airways, Air Sahara, Paramount airways, Go Air Airlines, Spice Jet, Air Deccan and many more. The startup players is those which are planning to enter into the markets. Some of them are Omega Air, Magic Air, Premier Star Air and MDLR Airlines.

Employment opportunities Today India Aviation Industry requires approximately 7,500-8,000 pilots and an equal number or more air cabin crew by 2010. Heavy pay packages are awaiting pilots with a commercial pilot license (CPL). An amateur pilot can start his career with a salary of Rs 2.5-3 lakh a month with a commercial airline. With the sudden increase in the number of airlines, pilots are in great demand.

Aviation sector provides the following types of opportunities:

- Commercial pilot
- Co-pilot
- Air cargo pilot
- Expert cabin crew
- Air traffic controller
- Cabin safety instructor
- In-flight managers
✓ In-flight base managers
✓ Cabin services instructor
✓ Cabin crew
✓ Training instructor
✓ Maintenance controllers
✓ Licensed aircraft maintenance engineering
✓ Quality control manager.
✓ Cargo officers
✓ Guest service agent
✓ Ground staff

**Latest developments:** Toward modernization of non-metro airports the Airports Authority of India (AAI) is planning to spend over US$ 1.02 billion in 2010. There are even plans of the city-side development of 24 airports, including airports at Ahmedabad and Amritsar. There are even additionally, 11 new Greenfield airports which are in pipeline which have been identified to reduce passenger load on existing airports.

The government has formed National Aviation Company Ltd (NACIL) by merging national carriers Air India and Indian Airlines into a single entity. The blue print was prepared by the civil aviation ministry to convert Delhi airport into an international hub for passenger airlines and has been done so recently.

**Modernization of Airports:** Airports Authority of India (AAI) manages the development and modernization of all 35 non-metro airports in the country simultaneously and work is due to be completed by the year end of 2010. Wholly owned subsidiaries of AAI are being created for betterment of these airports. According to the AAI there are work orders for terminal buildings at
13 airports, and for airside development, including runway, taxiway, apron, fire station, control tower and isolation bay, at 19 airports.

**Policy on Merchant Airports:** Indian Aviation Industry will allow 100% foreign direct investment (FDI) in the development of airport infrastructure, the Government is fast moving towards finalizing a policy on merchant airports. Under this new concept, merchant airports will be built entirely by private parties with their own resources, without any government funding.

**1.6. GROWTH IN MRO SEGMENT**

Indian Aviation with the advent of low-cost airlines & ever-increasing passenger traffic there is a fleet expansion. There is an Initiation of the whole new business avenue for global aircraft companies in maintenance, repair and overhaul (MRO). This MRO facility provides major and minor maintenance, refurbishment and repairs of aircraft. The giant players like Boeing and Airbus have announced their plans for MRO facilities in India\(^2^4\).

**Foreign Equity Participation in Air Transport Services:** Recently the Government in India has approved the Domestic Air Transport Policy which provides for foreign equity participation up to 49% and also investment by Non-Resident Indians (NRIs) up to 100% in the domestic air transport services. As the government plans to fix a higher foreign direct investment (FDI) ceiling for five sub-sectors of the industry in days to come the flow of foreign investment into aviation is likely to get smoother.

**Indian Aviation Industry: 2014 - 2015:** The Indian civil aviation industry is growing rapidly in the recent years. India is to become the third largest aviation market by 2020 and is expected to be the largest by 2030. Low-cost carriers, modern airports, foreign direct investments (FDI) in domestic airlines, information technology (IT) interventions and a growing emphasis on regional
connectivity have led to the expansion of the Indian Aviation Industry. In terms of market size, the Indian civil aviation industry is amongst the top 10 in the world with a size of around US$ 16 billion. India’s scheduled airlines carried 67.73 million passengers in 2014 compared with 61.42 million passengers in 2013, and 58.81 million in 2012, according to the DGCA. The domestic passengers carried by Air India were 12.42 million while the private carriers took in .95 million passengers. 

The market share of Air India remained at 18.4 per cent while for the private airlines it was 81.6 per cent. The airlines are projected to record a collective operating profit of Rs 8,100 crore (US$ 1.29 billion) in fiscal year 2016. Aircraft movements, passengers and freight at all Indian airports are expected to grow at a rate of 4.2 per cent, 5.3 per cent and 5 per cent, respectively, for the next five years, according to estimates by Airports Authority of India (AAI). In India's airports sector, total passenger traffic stood at a 169 million in FY14, registering an increase of 5.9 per cent. Domestic passenger traffic expanded at a compound annual growth rate (CAGR) of 11.6 per cent over FY06–14. It is expected to touch 209 million by FY17. International passenger traffic posted a CAGR of 9.6 per cent over FY06-14 and is set to touch 60 million by FY17. Total freight traffic registered a CAGR of 6.2 per cent over FY06-14. Domestic freight traffic increased at a CAGR of 7.1 per cent over FY06-14 while international freight traffic rose 5.8 per cent over the same period.

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<td>Air India</td>
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<td>2012</td>
<td>Mumbai</td>
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<td>Air Deccan - Merged with Kingfisher Airlines and rebranded as Kingfisher Red</td>
<td>2004</td>
<td>2007</td>
<td>Bengaluru</td>
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<td>3</td>
<td>Air Mantra</td>
<td>2012</td>
<td>2013</td>
<td>Delhi</td>
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<td>4</td>
<td>Air Sahara – Merged with Jet Airways and rebranded as JetLite</td>
<td>1991</td>
<td>2006</td>
<td>Mumbai</td>
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<td>1936</td>
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<td>Damania Airways - Renamed Skyline NEPC after takeover by the owners of NEPC Airlines</td>
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<td>1997</td>
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Source: Compiled from MOCA reports
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<td>1997</td>
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<td>37</td>
<td>Orient Airways - moved to Karachi and later merged into PIA</td>
<td>1946</td>
<td>1955</td>
<td>Kolkata</td>
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<td>Paramount Airways</td>
<td>2005</td>
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<td>Pushpaka Airlines</td>
<td>1979</td>
<td>1983</td>
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<td>Tata Airlines became Air India</td>
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<td>43</td>
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<td>1981</td>
<td>1997</td>
<td>Chennai</td>
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Source: Compiled from MOCA reports

1.7. PROFILE OF AIRLINES IN INDIA

India is one of the fastest growing aviation markets in the world. It has caused high competition to airline Industry. As by the DGCA Traffic data and No of Passengers carried by domestic airlines during Jan-Aug 2015 were 523.55 lakhs as against 433.24 lakhs during the corresponding period of previous year thereby registering a growth of 20.84%. There are scads
of private airlines increased their presence in India by ordering new fleets and destinations. We have amassed a list of the largest airlines in India, according to market share:\textsuperscript{26}

1. **Indigo Airlines**: IndiGo Airline is an Indian Low-cost airline company headquartered at Gurgaon, India. The airline offers more than 633 daily flights connecting to 38 destinations including 5 international destinations with its primary hub at Indira Gandhi International Airport, New Delhi. It presently operates a fleet of 97 aircraft belonging to the Airbus A320 family. In 2014, IndiGo carried 21.4 million passengers in the domestic sector.

- Total Market Share: 38.5%
- Fleet size: 97
- Passenger Load factors: 76.8%
- Cancellation Rate: 0.10%
- Passenger Complaints in average: 0.7% (No. of Complaints/10,000 Pax)

On-Time Performance (Scheduled Domestic Airlines):

- BLR: 90.0%
- DEL: 88.8%
- HYD: 85.0%
- BOM: 69.2%

*Chart 1.1: MARKET SHARE OF AIRLINE OPERATORS IN INDIA*
2. **Jet Airways**: Jet Airways is a major Indian airline based in Mumbai. It is the second largest airline in India, both in terms of market share and passengers carried, after IndiGo. It operates over 300 flights daily to 74 destinations worldwide. Its main hub is Mumbai, with secondary hubs at Delhi, Kolkata, Chennai, Bengaluru. Jet Airways serves 47 domestic destinations and 22 international destinations, a total of 69 in 19 countries across Asia, Europe and North America.

- **Total Market Share**: 19.8%
- **Fleet size**: 116
- **Passenger Load factors**: 80.8%
- **Cancellations**: 0.96%
- **Passenger Complaints in average**: 1.4 % (No. of Complaints/10,000 Pax)

**On-Time Performance (Scheduled Domestic Airlines):**

- **BLR**: 89.6%
- **DEL**: 87.6%
- **HYD**: 85.6%
- **BOM**: 82.7%
3. **Air India**: Air India is the flag carrier airline of India owned by Air India Limited (AIL), a Government of India enterprise. It is the third largest airline in India (after IndiGo and Jet Airways) in domestic market share, and operates a fleet of Airbus and Boeing aircraft serving various domestic and international airports. It is headquartered at the Indian Airlines House in New Delhi

- Total Market Share: 16.4%
- Fleet Size: 108 (excluding subsidiaries)
- Passenger Load factors: 79.3%
- Cancellations: 1.20%
- Passenger Complaints (average): 1.7% (No. of Complaints/10,000 Pax)
- On-Time Performance (Scheduled Domestic Airlines):
  - BLR: 83.4%
  - DEL: 79.4%
  - HYD: 78.6%
  - BOM: 68.2%

4. **SpiceJet**: SpiceJet is an Indian low-cost airline headquartered in Gurgaon, India. It is the country’s fourth largest airline by number of passenger carried with market share of 12.3% as of July 2015. The airline operates more than 270 daily flights to 41 destinations, including 34 Indian and 7 international cities

- Total Market Share: 12.3%
- Fleet size: 34
- Passenger Load factors: 92.1%
Cancellations : 0.70%

Passenger Complaints (average): 1.4% (No. of Complaints/10,000 Pax)

On-Time Performance (Scheduled Domestic Airlines):

- BLR: 81.3%
- DEL: 77.4%
- HYD: 76.9%
- BOM: 71.4%

5. **GoAir**: GoAir is an Indian Low cost carrier based in Mumbai. It commenced operations in November 2005. It is the aviation foray of the Wadia Group. As of January 2014, it is the fifth largest airline in India by market share. It operates domestic passenger services to 22 cities with over 140 daily flights and approximately 975 weekly flights. Its hubs are at Chhatrapati Shivaji International Airport, Mumbai.

- Total Market Share: 8.2%
- Fleet size: 19
- Passenger Load factors: 75.6%
- Cancellations: 0.44%
- Passenger Complaints (Average): 1.3% (No. of Complaints/10,000 Pax)

On-Time Performance (Scheduled Domestic Airlines):

- BLR: 85.6%
- DEL: 90.1%
- BOM: 76.9%
6. **Jetlite**: JetKonnect, is a low-cost brand of Jet Airways an airline based in Mumbai, India. owned by Jet Airways. It was originally their low-cost subsidiary called Jetlite, but started using the name JetKonnect after merging with Jet Airways’ other inhouse low cost brand in 2012. It is currently undergoing a process of integration with Jet Airways and flies for them as code share i.e. Jet Airways flights operated by JetKonnect, till the two are merged completely. All ground and onboard services are as on Jet Airways, and aircraft are being repainted in its livery.

- Total Market Share : 3.0%
- Fleet size : 9
- Passenger Load factors :78.7%
- Cancellations :0.44%
- Passenger Complaints (Average ): 1.4%(No. of Complaints/10,000 Pax)

On-Time Performance (Scheduled Domestic Airlines):

- BLR :89.6%
- DEL :87.6%
- HYD :85.6%
- BOM :82.7%

7. **AirAsia**: AirAsia India is an Indo-Malaysian low cost carrier headquartered in Chennai, India. The airline is a joint venture with Air Asia Berhad holding 49% of the airline, Tata Sons holding 40.06% and Telestra Trade place having the remaining 10% in the airline. The joint venture would also mark Tata’s return to aviation industry after 60 years. Air Asia India
commenced operations on 12 June 2014 with Bangalore as its primary hub. AirAsia is the first foreign airline to set up a subsidiary in India

- **Total Market Share**: 1.4%
- **Fleet size**: 5
- **Passenger Load factors**: 72.1%
- **Cancellations**: 0.0%
- **Passenger Complaints (Average)**: 1.0% (No. of Complaints/10,000 Pax)

8. **Vistara**: Vistara is an Indian airline based in Gurgaon with its hub at Delhi-Indira Gandhi International Airport. The carrier, a joint venture between Tata Sons and Singapore Airlines, commenced operations on 9 January 2015 with its inaugural flight between Delhi and Mumbai and had carried a total of 500,000 passengers by August 2015. As of September 2015, the airline operates 251 weekly scheduled passenger services across 10 domestic destinations within India with a fleet of 6 Airbus A320-232 aircraft. Vistara was the first airline to introduce premium economy seats on domestic routes in India

- **Total Market Share**: 1.3%
- **Fleet size**: 7
- **Passenger Load factors**: 62.9%
- **Cancellations**: 0.19%
- **Passenger Complaints (Average)**: 0.2% (No. of Complaints/10,000 Pax)

9. **Air Costa**: Air Costa is an Indian regional airline based in Vijayawada, Andhra Pradesh. The first flight was on October 2013, from Chennai which is one of their main operating and maintenance hubs. It is part of the LEPL Group, a Vijayawada-based company, and has started
with 300 employees including expatriate pilots and engineers and commenced scheduled operations in October 2013 using two Embraer E-170 aircraft.

- Total Market Share: 1.0%
- Fleet size: 4 (+50 on order)
- Passenger Load factors: 77.3%
- Cancellations: 0.79%
- Passenger Complaints (Average): 0.8% (No. of Complaints/10,000 Pax)

10. Air Pegasus: Air Pegasus is an Indian regional airline based in Bangalore, India. The airline, subsidiary of Decor Aviation, an aircraft ground-handling services company, commenced operations on 12 April 2015 with its inaugural flight between Bangalore and Hubli. As of September 2015, Air Pegasus serves 6 airports across South India from its main hub at Kempegowda International Airport in Bangalore with a fleet of 2 ATR 72-500 aircraft.

- Total Market Share: 0.2%
- Fleet size: 2
- Passenger Load factors: 77.1%
- Cancellations: 5.81%
- Passenger Complaints (Average): 1.4% (No. of Complaints/10,000 Pax)

1.8. PROMINENT AIRLINES OF THE WORLD

The world’s top 10 airlines of 2015 voted for by travelers around the world. Skytrax World Airline Awards, described as "the Oscars of the aviation industry", are coveted Quality accolades for the world airline industry, and a global benchmark of airline excellence. Travellers
from across the globe take part each year in the world’s largest airline passenger satisfaction survey to decide the award winners.

Previous World Airline Award winning airlines include Aegean Airlines, Air Arabia, AirAsia, AirAsia X, Air Berlin, Air Canada, Air New Zealand, Alaska Airlines, ANA All Nippon Airways, Asiana Airlines, Avianca, Azul Airlines, British Airways, Cathay Pacific, China Southern Airlines, Copa Airlines, Dragonair, Emirates, Ethiopian Airlines, Etihad Airways, Finnair, Garuda Indonesia, GOL, Hainan Airlines, IndiGo Airlines, Japan Airlines, JetBlue Airways, Jetstar Airways, KLM Royal Dutch Airlines, Kulula, LAN Airlines, Lufthansa, Malaysia Airlines, Norwegian, Oman Air, one world, Qantas Airways, Qatar Airways, Shenzhen Airlines, Singapore Airlines, South African Airways, Star Alliance, Swiss Int'l Airlines, TACA Airlines, Thai Airways, Tianjin Airlines, Thomson Airways, Transaero Airlines, Turkish Airlines, Virgin America, Virgin Atlantic, Virgin Australia and WestJet.

1. **QATAR AIRWAYS** : In a relatively short time, **Qatar Airways** has grown to more than 140 destinations worldwide, offering levels of service excellence that helped the award-winning carrier to become best in the world. Qatar Airways network spans business and leisure destinations across Europe, Middle East, Africa, Asia Pacific, North America and South America. Qatar Airways is a member of one world global airline alliance

2. **SINGAPORE AIRLINES**: **Singapore Airlines** is one of the most respected travel brands around the world. Flying one of the youngest aircraft fleets in the world to destinations spanning a network spread over six continents, the Singapore Girl is an internationally-recognizable icon providing the high standards of care and service that customers have come to expect of Singapore Airlines.
3. CATHAY PACIFIC AIRWAYS: Voted Airline of the Year 2014, Cathay Pacific Airways has won the 'World's Best Airline' award for the fourth time, more than any other airline. Cathay Pacific is a member of the one world global airline alliance. The Cathay Pacific Group, including Dragonair and Air Hong Kong, operate more than 150 aircraft to 130 destinations across the globe.

4. TURKISH AIRLINES: Established in 1933 with a fleet of only five airplanes, Turkish Airlines flies to more countries in the world than any other airline (105 countries over five continents). Turkish Airlines now has a fleet of 261 aircraft (passenger and cargo) flying to 243 cities around the world. Turkish Airlines is a member of Star Alliance.

5. EMIRATES: Founded in 1985, and flying out of Dubai with just two aircraft, Emirates now has a fleet of more than 230 aircraft, and currently fly to over 140 destinations in more than 80 countries around the world. The Emirates network is expanding constantly, with over 1,500 flights departing Dubai each week on their way to destinations on six continents.

6. ETIHAD AIRWAYS: Etihad Airways commenced operations in November 2003, and airline seeks to reflect the best of Arabian hospitality. The airline flies to destinations in the Middle East, Africa, Europe, Asia, Australia and the Americas, with a fleet of 117 Airbus and Boeing aircraft.

7. ANA ALL NIPPON AIRWAYS: Japanese carrier, ANA All Nippon Airways is the 13th largest airline in the world by revenues (2013). Founded in 1952, ANA flies on 72 international routes and 115 domestic routes with a fleet of about 240 aircraft. ANA was the launch customer and biggest operator of the Boeing 787 Dreamliner.
8. **GARUDA INDONESIA**: Garuda Indonesia is the national airline of Indonesia, operating one of the youngest average age of aircraft fleet in Asia, with an average aircraft age at December 2014 of 4.02 years. The fleet consists of 130 aircraft, due to grow to 145 aircraft in 2015. Garuda Indonesia delivers the hospitality and culture of Indonesia to travellers worldwide.

9. **EVA AIR**: EVA Air is the second largest Taiwanese airline, flying to over 40 international destinations in Asia, Australia, Europe, and North America. In June 2013, EVA became a Star Alliance member. The airline's slogan is Sharing the World, Flying Together.

10. **QANTAS**: Qantas Airways is the flag carrier airline of Australia. The airlines flies to 20 domestic destinations and 21 international destinations in 14 countries across Africa, the Americas, Asia, Europe and Oceania.

1.9. **CHALLENGES OF THE AVIATION INDUSTRY**

*The following are the challenges of aviation industry:*

- The long-term challenges lie in the high cost of operations due to factors unique to India. While aviation may have been opened up to all players, it is still over regulated.

- Due to the monopoly of state owned oil firms jet fuel prices are up to two times higher than the international average.

- In addition to the marketing charges and import and customs duties that oil companies levy, state governments also levy their own sales taxes ranging from 4% to 40%.

- Another notable factor is that domestic carriers accounts for a third of airline operating costs in India, double the global average.

- Manpower shortage is also an urgent concern. Due to the volume of new aircraft on order, India would need 3,000 pilots to add to the current 2,000 by 2013.
• Already, local carriers have had to hire 300 pilots from overseas.

• The wages of the local recruits have to match the structure of the expatriates irrespective of whether LCA’s or FSA’s.

• The most alarming constraint is the lack of physical space to accommodate new aircraft.

• Major domestic airports like Mumbai and Delhi have little to no overnight parking slots. Their single runways are also designed to turn around only 15 aircraft an hour, just a third of the global average; planes need to taxi and fly around in circles for 30 minutes before take-off and landing.

CHART 1.2: PASSENGER TRAFFIC IN FY’15

1.10. FUTURE OF AVIATION INDUSTRY IN INDIA
India’s civil aviation industry is on a high-growth trajectory. India aims to become the third-largest aviation market by 2020 and the largest by 2030. The Civil Aviation industry has ushered in a new era of expansion, driven by factors such as low-cost carriers (LCCs), modern airports, Foreign Direct Investment (FDI) in domestic airlines, advanced information technology (IT) interventions and growing emphasis on regional connectivity. India is the ninth-largest civil aviation market in the world, with a market size of around US$ 16 billion.

The world is focused on Indian aviation – from manufacturers, tourism boards, airlines and global businesses to individual travellers, shippers and businessmen. If we can find common purpose among all stakeholders in Indian aviation, a bright future is at hand,” said Mr. Tony Tyler, Director General and CEO, International Air Transport Association (IATA).

**Market Size:** In the July-September quarter of 2015, domestic air passenger traffic surged 21.5 per cent to 20.12 million from 16.57 million in the corresponding period a year ago. Total passengers carried in September 2015 increased 13.24 per cent Y-o-Y to 8.73 million from 7.71 million in September 2014. International and domestic passenger traffic grew 6.6 per cent and 15.5 per cent, respectively, in September 2015.

In September 2015, total aircraft movements at all Indian airports stood at 145,628, which was 10.2 per cent higher than September 2014. International and domestic aircraft movements increased 7.5 per cent and 11 per cent, respectively, in September 2015.

Over the next five years, domestic and international passenger traffic are expected to increase at an annual average rate of 12 per cent and 8 per cent, respectively, while domestic and international cargo are estimated to rise at an average annual rate of 12 per cent and 10 per cent, respectively.
The airlines operating in India are projected to record a collective operating profit of Rs 8,100 crore (US$ 1.29 billion) in fiscal year 2016, according to Crisil Ltd.

**Investment**

According to data released by the Department of Industrial Policy and Promotion (DIPP), FDI inflows in air transport (including air freight) between April 2000 and June 2015 stood at US$ 573.12 million.

**Key investments and developments in India’s aviation industry include:** The Ministry of Civil Aviation has signed Memorandum of Understanding (MoU) with Finland, Kazakhstan, Kenya, Sweden, Norway, Denmark, Oman and Ethiopia for increased co-operation between the countries in terms of additional seats, sharing of airlines codes, increased frequencies and additional points of call, during the International Civil Aviation Negotiations (ICAN), 2015 held in Antalya, Turkey.

Tata Advanced Systems (TASL) has signed a joint venture with American aircraft manufacturing major, Boeing, to establish a centre of excellence for manufacturing aero structures for Apache helicopter initially and collaborate on integrated systems development opportunities in India in the long term.

US-based aircraft manufacturer Boeing plans to assemble one of its two helicopters namely, Chinook (heavy-lift) or Apache (attack type) in India, thus becoming yet another global company to invest in India encouraged by the ‘Make in India’ campaign.

Airbus SAS, one of the top two aircraft manufacturers in the world, plans to open aircraft maintenance and repair overhaul (MRO) facility in India.
Airbus, the world’s leading aircraft maker, expects India’s aviation industry to grow at over 10 per cent annually in the next decade, almost double the average growth rate of the global aviation industry\textsuperscript{33}.

Eyeing large orders from Indian airlines, Airbus has committed to source products worth US$ 2 billion cumulatively over the next five years from India; the company plans to provide customised maintenance and other services closer to the base for all its airline customers in India.

French drone-maker LH Aviation signed a Memorandum of Understanding (MoU) with India’s OIS Advanced Technologies on June 19, 2015 to manufacture tactical drones in India through an industrial license.

Mahindra Group expanded its partnership with GE Aviation by signing an agreement to manufacture aero structures at the Group’s new aerospace facility in Bengaluru.

IndiGo plans to file documents for an initial public offering within the next two months to raise US$ 400 million by selling 10 per cent stake.

SpiceJet plans to enter a deal with Boeing Co. and Airbus Group SE to buy 80-120 jet airplanes which would help to expand their fleet and rebuild its business\textsuperscript{34}.

1.11. GOVERNMENT INITIATIVES

Government agencies project that around 500 Brownfield and Greenfield airports would be required by 2020. The private sector is being encouraged to become actively involved in the construction of airports through different Public Private Partnership models, with substantial
state support in terms of financing, concessional land allotment, tax holidays and other incentives\textsuperscript{35}.

1.12. **HUGE POTENTIAL**

Even if it takes 30 years to achieve this goal, it is still a stupendous growth potential. And India would have only reached one fourth of the number of flights currently operated in Western Europe or the U.S. The Singapore airport alone handles in excess of 30 million passengers a year which is twice the number of domestic air-passengers for the whole of India handled by its airports\textsuperscript{36}.

Congestion in airports not only restrains growth but increases the cost of air travel. Airplanes make money when they fly and not when they are on the ground. Congested and inefficient airports reduce the number of hours that aircraft can fly in a day. The Mumbai and Delhi airports, though not very efficient in terms of capacity utilization, are already choked. The Government has to plan for large airports on the lines of Shanghai and Hong Kong, but as the envisaged international airports may take 4 to 5 years to materialize, the capacity of existing airports can in the meantime be augmented by putting the runways, taxiways and parking areas to more efficient use.

Indian airports handle a maximum of 24 flights an hour as against 45 to 50 in busy international airports. There is need for airport management staff and air traffic controllers and better technology deployment on which the Government has already initiated action. A sense of urgency, passion and ownership is lacking and a systematic change is necessary\textsuperscript{37}.

Traffic handling capacity at airports will have to be enhanced by increasing the number of aircraft landing and taking off on the air-side and the departure gates and check-in counters on the terminal side. Even here, in addition to better infrastructure and training of air traffic controllers, existing rules, regulations and processes have to be reviewed for greater capacity utilization without compromising safety\textsuperscript{38}.
A different approach is required for regional airports and airstrips. There are nearly 400 airports and airstrips in the country striving for connectivity. The Government must conserve its scarce resources and priorities the exercise. Here the priority must go to runways and equipment for air traffic control rather than fancy buildings. The upgradation of regional airports must be done in a phased manner. Under a long-term plan State governments can also be involved in developing airports within their geographical regions.

Thus, it is imperative that air travel is available at affordable rates and there should be reliability of operations. To achieve reliability, the focus must be on providing infrastructure in terms of the latest navigational aids. If Indian aviation has to keep pace with the country’s economic development and also earn the confidence of foreign institutions, it is time the ways it is governed is changed. Reforms are needed to ensure the aviation business is lucrative and procedures are simplified and made user friendly but conforming to the highest standards of safety. There is the required political will at the highest level, especially in matters relating to civil aviation. What is required is a system whereby the bureaucracy becomes efficient and rules and regulations are simplified so that more entrepreneurs enter the aviation arena to truly revolutionize air travel in India.

As the Indian economy picks up momentum for take-off, the need for developing a world-class civil aviation sector has assumed great urgency. In the past, civil aviation did not figure prominently among the priorities of Indian planners. The emergence of the service industry, especially information technology, as the prime mover of the economy has changed that perception dramatically and brought into focus the inadequacies of this sector. The open sky policy opened the eyes of the Government to the existence of a huge untapped market and led to a gradual shift in the policy from protection of Air India’s interests to meeting the requirements of the national economy.

The domestic air services also witnessed a major expansion and power shift comparable to the scenario that emerged after the end of public sector monopoly in 1993-94. The floodgates opened with
the entry of Air Deccan as a low cost carrier in 2003. It was the trigger for a new revolution encouraging both new airlines and new air travelers.

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