

PREAMBLE IN AUTOMOBILE INDUSTRY

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ABSTRACT

This paper describes the evolution of the industry and discusses the main factors that have shaped its development. In the process, a detailed account of the current status of the industry, as well as its main players, is provided. A second report, which is planned, will analyze critical factors that have hindered further success, and will identify some components of potential strategies for the future.

KEY WORDS: Automobile industry, Indian Industry, other industry

INTRODUCTION:

The Indian automotive industry has emerged as a 'sunrise sector' in the Indian economy. India is emerging as one of the world's fastest growing passenger car markets and second largest two wheeler manufacturer. It is also home for the largest motor cycle manufacturer and fifth largest commercial vehicle manufacturer. India is the largest base to export compact cars to Europe. Moreover, hybrid and electronic vehicles are new developments on the automobile canvas and India is one of the key markets for them. Global and Indian manufacturers are focusing their efforts to develop innovative products, technologies and supply chains.

AUTOMOBILE INDUSTRY:

Automobile industry, the business of producing and selling self-powered vehicles, including passenger cars, trucks, farm equipment, and other commercial vehicles. By allowing consumers to commute long distances for work, shopping, and entertainment, the auto industry has encouraged the development of an extensive road system, made possible the growth of suburbs and shopping centers around major cities, and played a key role in the growth of ancillary industries, such as the oil and travel businesses. The auto industry has become one of the largest purchasers of many key industrial products, such as steel. The large number of people the industry employs has made it a key determinant of economic growth. Automobile is self propelled vehicle which is used for the transportation of passenger and good upon the ground. A vehicle is machine which is used for the transportation of passengers and goods. Car, bus truck, jeep, tractor, scooter, motor cycles are the example of automobiles.

DIFFERENT NAMES OF THE AUTOMOBILE:

1. Auto
2. Auto car
3. Car
4. Motor car
5. Automobile
6. Auto buggy

7. Motor coach
8. Motor vehicle
9. Motor
10. Motor wagon
11. Horseless carriage

TYPES OF AUTOMOBILES:

The automobiles are classified on the following basis:-

1. Purpose :

- (i) Passenger vehicle- car, jeep, bus
- (ii) Good Vehicle- Truck

2. Capacity :-

- (I) Light motor vehicle- car, motor cycle, scooter.
- (II) Heavy Motor vehicle- Bus coach, tractor.

3. Fuel used:-

- (i) Petrol vehicles – car, jeep, motor cycle, scooter.
- (ii) Diesel Vehicles- Truck, bus, tractor, bulldozer.
- (iii) Electric cab- Battery truck, fork lift, scooter
- (iv) Stream carriage- stream road rollers.

4. No of Wheels :-

- (i) Two Wheeler
- (ii) Three Wheeler
- (iii) Four Wheeler
- (iv) Six Wheeler.

5. Drive of the vehicles :-

- (i) Singles wheel drive vehicle
- (ii) Two wheel drive vehicle
- (iii) Four wheel drive vehicle
- (iv) Six wheel drive vehicle

DEVELOPMENT OF AUTOMOBILE INDUSTRY:

THE WHEEL:

The invention of the wheel paved the way for transportation as we know it today. Historians don't know exactly who invented the wheel, but the oldest wheel discovered so far is believed to be over 5,500 years old. The development of the wheel began when humans sought easier methods for moving large objects. It was recognized that round objects, such as a log, could be placed under something heavy to push it along with less force. Next humans began using a sledge. A sledge is essentially what today we would call a sled. A sledge worked well over smooth ground or with logs placed under it as it was pulled along. Eventually the sledge wore grooves in the log rollers. The grooved rollers worked better since there was less friction between the sledge and the rollers, so less energy was needed to drag the sledge. It wasn't long before humans cut away the wood between the two inner grooves created by the sledge. The wood left between the grooves became the axle. These were the first carts. Next, axles were designed to fit through holes in the center of each wheel. Finally, axles were designed not to move themselves, but rather to have the wheel rotate on the axle. The ancient Egyptians, Indians, Greeks and Romans continued to improve the design of the wheel, adding spokes and creating a variety of wheels for different sorts of vehicles including chariots for war, hunting, and racing, two-wheeled farm carts, covered carriages, heavy four-wheeled freight wagons and passenger coaches.

HORSE POWER:

For centuries wheeled vehicles were pulled by oxen, horses or even people. Until the invention of the internal combustion engine, the horse was Europe's most important source of energy. The term 'horsepower' is still used today to measure the power limits of machine engines. Horses allowed civilizations to extend their power and expand their territories. When paired with wheeled vehicles such as carts, chariots and carriages, this harnessed power allowed people more freedom to travel, explore and settle new land. However, even horse drawn transportation came with its own source of pollution. Waste from horses was a serious concern in cities and it became more and more difficult to maintain sanitary conditions as the number of people and, therefore, horses grew. Concerns over these conditions led some innovators to look towards alternative forms of transportation.

STEAM POWERED VEHICLES:

In the 17th century, steam-powered vehicles, dubbed "horseless carriages," came on to the scene. However, it was not until the early 18th century and the invention of the high pressure steam engine that these steam-powered vehicles were considered as potentially practical. Limitations in building technology and the poor condition of road surfaces limited these "steam cars" as personal transportation until the 19th century. At first, their sheer heaviness meant that they needed the support of iron rails to move effectively. This of course led to the use of steam engines in trains, thus powering the railroad industry. By 1902, 485 out of 909 new car registrations were for steamers. In 1906, the land speed record was broken by a Stanley steam car. The car and driver reached 127 miles per hour! The steam engine powered the vehicle by burning wood, coal or oil to heat water in a boiler. The steam that was generated drove pistons up and down within hollow cylinders. The movement of the pistons drove the crankshaft, which ultimately turned the wheels. In addition to their considerable weight, steam powered vehicles had several other disadvantages. They required long start-up times and required frequent stops to get water.

ELECTRIC VEHICLES:

In the 1830s, inventors also began to use electric motors to power vehicles. Like electric cars today, they ran on energy stored in rechargeable batteries. Unfortunately, the energy storage capacity of the early batteries was very limited, and these vehicles could travel relatively short distances before the batteries needed to be recharged. Although the range of early electric vehicles was limited, they could travel further on a single charge than steam-powered vehicles could go without stopping to renew their water supply. Initially, the electric car's limited range was not a liability because the only good roads at the time were in towns. The electric car also had several advantages over other types of vehicles until the early 1900's. Driving electric cars, like steam-powered vehicles, did not require changing gears, which was a difficult maneuver in driving early gasoline-powered cars. In comparison to cars with gas engines, electric vehicles were also quieter, offered a smoother ride, and were relatively odor-free. They also did not require a long start-up time like the steam car or the considerable manual effort that was required to start a gas-powered car with a hand crank. In 1899 and 1900, the sale of electric cars surpassed those of all other types of vehicles in the U.S. However, the prominence of the electric car was destined to be short-lived as several developments shifted the advantage to gasoline powered vehicles.

INTERNAL COMBUSTION ENGINES:

As more and better roads were built to connect cities, the electric car's limited range eventually became a liability, and vehicles with gasoline engines, which had a much longer range, became more popular. Other developments also helped the gas-powered car gain prominence. The price of gasoline became more affordable with the discovery of vast oil reserves in Texas in 1901, and the introduction of the conveyor belt assembly line system by Henry Ford in 1913 reduced production costs of gas powered vehicles, making them more affordable as well. However, the development which had the biggest impact was probably the

invention of the electric starter in 1911. Before this invention, gasoline-powered internal combustion engines had to be started by a hand crank. The hand crank was difficult to use and sometimes even quite dangerous. Improper cranking could cause a backfire strong enough to break the arm of the crankier. With the invention of the electric starter, cars with gas engines became safer to start and what had been the electric car's major advantage was eliminated.

HISTORY OF AUTOMOBILE INDUSTRY IN WORLD:

This chapter highlights history of Automobile Industry of the world and in India. The present position of this Industry in the world and India is studied. The scope of Automobile Industry in the near future is also explained. Finally all players in Automobile Industry of India are enumerated in this chapter. The automobile as we know, it was not invented in a single day by a single inventor. The history of the automobile reflects an evolution that took place worldwide. It is estimated that over 100,000 patents created the modern automobile. However, we can point to the many firsts that occurred along the way. Several Italians recorded designs for wind driven vehicles. The first was Guido da Vigevano in 1335. Vaturio designed a similar vehicle, which was also never built. Later Leonardo da Vinci designed clockwork driven tricycle with tiller steering and a differential mechanism between the rear wheels. A Catholic priest named Father Ferdinand Verbiest has been said to have built a steam powered vehicle for the Chinese Emperor Chien Lung in about 1678. Since James Watt didn't invent the steam engine until 1705 it is guessed that this was possibly a model vehicle powered by a mechanism like Hero's steam engine, a spinning wheel with jets on the periphery. The first vehicle to move under its own power for which there is a record was designed by Nicholas Joseph Cugnot and constructed by M. Brezin in 1769. A second unit was built in 1770, which weighed 8000 pounds and had a top speed on 2 miles per hour 68 and on the Cobble Stone Streets of Paris this was probably as fast as anyone wanted to go it. The early steam powered vehicles were so heavy that they were only practical on a perfectly flat surface as strong as iron. A road thus made out of iron rails became the norm for the next hundred and twenty-five years. The vehicles got bigger and heavier and more powerful and as such they were eventually capable of pulling a train of many cars filled with freight and passengers. Many attempts were being made in England by the 1830's to develop a practical vehicle that didn't need rails. A series of accidents and propaganda from the established railroads caused a flurry of restrictive legislation to be passed and the development of the automobile by passed England. A few prototype were built but no production cars were ever made by this company. It was dissolved in January 1901. Ford would not offer a car for sale until

1903. Eli Olds built first petrol-powered car. This car was running by 1896 but production of the Olds Motor Vehicle Company of Detroit did not begin until 1899. After n early failure with luxury vehicles they established the first really successful production with the classic Curved Dash Oldsmobile. It sold for \$650. In 1901 600 were sold and the next years were 1902 - 2,500, 1903 - 4,000, and 1904 - 5,000. In August 1904 Ransom Olds left the company to form Reo for Ransom Eli Olds. E. Olds was the first mass producer of gasoline-powered automobiles in the United States, even though Duryea was the first auto manufacturer with their 13 cars. The Rolls Royce Silver Ghost of 1906 was a six cylinder car that stayed in production until 1925. It represented the best engineering and technology available at the time and these cars still run smoothly and silently today. This period marked the end of the beginning of the automobile.

THE AUTOMOBILE INDUSTRY AT PRESENT:

For most of the history of automobiles, a car was expected to do little more than travel from place to place with some degree of reliability and economy. As roads and technology improved and more people began to use them, cars were expected to go a little faster, ride more comfortably and last long enough to make the investment worthwhile. Almost any new car could do these things well by the early 1930s, and even as technology advanced over the next 40 years, what the world expected of a car remained basically the same. Speed, convenience and reliability improved steadily, but for more than 70 years, a car was expected to do nothing more than move people and their stuff with a degree of comfort and style commensurate with the sale price. Then the governments got involved in automobile design. Actually, various state

governments started requiring certain safety items as the technology became practical, such as electric lights, safety glass and redundant throttle return springs. But beginning with the creation of the Federal Motor Vehicle Safety Standards in 1966 and the U.S. Environmental Protection Agency in 1973, the very mission of the automobile began changing. Instead of just carrying people and their stuff quickly, comfortably and reliably, cars were eventually required to protect their occupants in a crash, retain all unburned fuel vapors, convert the byproducts of combustion into less harmful gases and report their own malfunctions. Today they must meet these and many other safeties and performance requirements set by the Society of Automotive Engineers, the repair industry and several governments, especially if the car is built for export. As if new technical design standards weren't enough, the buying public's idea of an automobile has also gone light-years beyond reliable, economical transportation. The concept of 'automotive style, which once referred to a range with economy cars at one end of the spectrum and luxury models at the other, has now expanded to include maybe a dozen different types of automobiles. Compared with earlier designers was including those resurrected from the dead to make television commercials, today's automotive designers and engineers are nothing less than heroes. The total number of persons employed directly and indirectly by the industry--from manufacturing to sales is 7.2 million, or 11% of Japan's working population. Nissan Motor Co. Ltd. is building a \$930 million vehicle manufacturing plant in Canton that will encompass 2.6 million square feet and produce about 250,000 units annually. Three vehicles will be produced at this facility, a full-size pickup truck, a fullsize sport-utility vehicle and a newly designed minivan. Production has slated to begin in mid-2003. The plant initially will employ 3,300 workers. Nissan's production strategy includes having suppliers build modules and components in the same sequence as the vehicles are produced on the production line. In increasing numbers, suppliers and support services also are locating plants adjacent to, or near, the new Nissan plant.

THE INDIAN AUTOMOBILE INDUSTRY AT PRESENT:

There are 48 companies in the Automobile Industry in India that comprise of all vehicles, including two and three-wheelers, Passenger Cars and multi-utility vehicles, light, medium and heavy commercial vehicles, agriculture and earth moving machinery. Since the inception of the Automobile Industry in India till liberalization since 1942 to 1991, in a fifty-year period only 31 companies have been established in the Industry; while in post-liberalization period in a ten-years period from 1992 till 2001, 17 companies entered to the Industry. Most of these new entrance all multinational companies that have joint venture with Indian companies. Multinational companies own more than 50% stake in their joint ventures, and sometimes this stake comes near to 100%. For example Italian Auto major, Fiat Auto Spa has 94.77% stake in Fiat India Limited. A few of these new companies are fully subsidiary of foreign companies like Yamaha Motor India Ltd which is 100% subsidiary of Yamaha Motor Company of Japan. Some Indian Automobile companies have several subsidiaries for manufacturing different vehicles, same as Eicher Ltd, Sonalika Group, Escorts Ltd and Mahindra & Mahindra. Eicher Ltd includes Eicher Tractors Ltd for tractors manufacturing and Royal Enfield Motors Limited in motorcycles section. Sonalika Group has International Tractors Limited for the manufacture of tractors incorporated 1995 and Sonalika Agriculture Corporation was established in 1971 that has approximately 80% share in Indian market of farm machinery. Escorts Ltd also includes Escorts Tractors Ltd and Escorts JCB Ltd. Mahindra & Mahindra has Mahindra Nissan Allwyn and Gujarat Tractors Corporation as subsidiaries.

MAJOR DEVELOPMENTS and INVESTMENTS

- Mercedes-Benz India plans to increase its investment to Rs 850 crore by 2014. The German car maker through its dealer partners has already invested over Rs 480 crore in India. The company has also announced the starting of its new, startof- the-art paint shop that is capable of water-based painting.

- The Volkswagen Group aims to increase output by 10-15 per cent on a €100 million (US\$ 126.35 million) investment at its production facilities in Aurangabad and Chakan in Maharashtra.
- Nissan plans to introduce ten new passenger vehicles by the end of March 2016. Nissan India aims to double its vehicle sales in 2012-13 from 33,000 vehicles in 2011-12.
- Volvo Eicher Commercial Vehicles (VECV), the joint venture (JV) between Volvo and Eicher is ready a whole new range of trucks with new platforms, engines and cabins. VECV has already invested Rs 700 crore in the business.
- Toyota Kirloskar plans to increase capacity at its two plants in Bidadi, Karnataka, from 310,000 units to 400,000 units a year. Capacity at the first plant would rise from 90,000 units to 100,000 units, at a cost of Rs 70 crore and the second plant's capacity is being increased from 120,000 units to 210,000 units, with an investment of Rs 830 crore.
- Blackstone Capital Partners in Singapore has signed an agreement to acquire 12.5 per cent stake of International Tractors Ltd (ITL) in a structured transaction worth US\$ 100 million.
- Mahindra Reva Electric Vehicles has inaugurated a new manufacturing facility in Bommasandra on the outskirts of Bengaluru, Karnataka. The new manufacturing facility has an installed capacity to produce 30,000 vehicles annually.

INDIAN AUTOMOBILE INDUSTRY SWOT ANALYSIS:

STRENGTHS:

- Globally cost competitive.
- Adheres to strict quality controls.
- Adoption or Access to latest technology.

WEAKNESS:

- Low research and development capability.
- Industry is exposed to cyclical downturns in the automotive Industry.
- Most component companies are dependent on global majors for technology.

OPPORTUNITIES:

- Sourcing hub for global automobile majors.
- Export opportunities may be realized through diversification of export basket.

THREATS:

- Pressure on prices from OEM"s continues.
- Imports from FTA Regime Countries, in certain component segments are a threat to local industry.
- Smaller players, who do not upgrade to global standards, would get extinct.

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