

Impact of automation in manufacturing of cars

[Business](#), [Manufacturing](#)



Industrial and Automation in manufacturing of cars started out as an assembly line of workers doing continuous tasks the whole day. Some of the jobs were very tedious, filthy, troublesome, and hazardous as a result companies were unable to follow the correct work laws which were enforced by the government to protect employees. As the demand of cars increased this meant that humans were no longer effective in the mass production of cars, this led to manufactures coming up with more effective methods of producing cars in large quantities to meet the demand thus automation was introduced. Now that computers and technology such as Automotive CNC machines for the automobile industry have penetrated in the industry, automation has become the competitive advantage in today's car manufacturing world. Automation has allowed companies to mass produce products at outstanding speed and with great repeat ability and quality. Each of the basic styles of automation used in industry nowadays was designed with different applications in mind.

To define automation, this is the process whereby control systems, main computers or robots and information technologies for handling different processes and machineries in an industry to replace human beings. It is the second step beyond mechanization in the scope of industrialization (M. Brei, 2013). According to (Groover, 2018) generally it is concerned with performing a process by use of programmed commands with combined automatic feedback control to ensure proper execution of the given instruction. The three known types of industrial automation are programmable, flexible and fixed automation.

This literature is going to explore the impacts of automation in the manufacturing of cars which is basically the marked effects of the creation and the application of automation technology to monitor the production process. The main impacts of automation in manufacturing of cars include the economic, social, environmental and political impacts. The research will be more focused on the four major impacts analyzing the positive and negative impacts they can bring. The first aspect will be looking at the positive side of each of the stated impacts and concluding with the negative impacts for each.

ECONOMIC IMPACTS

Ever since automation was introduced, production has been effective and brought forth more than hundreds folds of profits and satisfaction to business men and women. Nowadays robots are used in compilation and bringing together different pieces to make a car that can move. This needs fewer people to produce the same number manufactured goods, and has led to more jobs being displaced in traditional areas of work. Automation enables firms to produce goods at lower costs and it led to significant economic scale importance in industries which require high capital investment. To give a practical example, in China, there is an automotive plant in Tianjin belonging to Chinese automaker GREAT WALL MOTORS, has 30 workstations occupied by 27 robots that perform more than 4000 high precision welding operations. The robots are so fast that they can complete the welding of an entire Hoval SUV in just 86 seconds. On the assembly line, more than many other places, time is money. Peter Murray (2013)

Automation in manufacturing of cars is fast and effective and produces quality goods as machines can produce goods 24/7 if they maintained and serviced well. It enables a greater economy of scope as machines can produce a greater range of goods, thus diversity and product differentiation is important for firms as lower unit labour costs. In early years, the goal was to produce goods cheaply as possible thus the key for customers nowadays is to receive greater customisation of products faster and safe. It enables customers to be able to customise the size e. g. look and function of a particular car rather than just picking a standard model. Lastly it enables shorter lead times, quicker and more efficient use of stock and cash flow.

Automation brings out high information accuracy as the machines are programmed to do a particular task and will perform accordingly without an error or minimum error if they are maintained and serviced accordingly. This allows you to collect key production information, improve accuracy and reduce your data collection costs. This provides you with the facts to make the right decision when it comes to reducing waste and improving your processes

In life, every situation has the pros and cons and the negative economic impacts of automation in manufacturing of cars is that automation has does not lead to net job gain as some jobs will be created making new tools. But the use of new tools will always eliminate new jobs. No organisation invests in automation if the net-present value costs are greater than savings. In other words, if it takes 100 hours of work to build a machine that saves 90 hours of work, no company will adopt it. The other negative impact is that it

requires significant capital investment and the benefits may take several years to exceed current production methods thus high initial capital to start is required. It takes a patient business man and woman to succeed in the industry of business. Also some machinery depends on electricity due to load shedding thus may delay the production of cars if there is a power cut and the growth of the firm may be slow and therefore may lose potential buyers. The last negative economic impact to be discussed is that automation demands a certain skill set and educational training for employees to be operate a connected, technologically and advanced manufacturing facility. This puts the less educated personnel in a dead pool and also may not be able to operate the machines. Automation can no longer wait for an educated and training next generation of manufacturing talent.

To continue on the impacts there are also social impacts that includes increased safety as machines will only perform the task being executed to perform and do it safely when running smoothly other than humans who can make mistakes due to human errors and are more likely changes to make other than a machine. Humans will never be able to compete with the productivity and efficiency provided by machines . Robots offer accuracy , incredible consistency and unlimited performance . They perform the exact same task without variation , complaint or error . Robots drive efficiency.

Automation may increase corporate profit . when corporate profits increase it means that wages of employees can be increased in some situation when employees get high wages it means that they will have higher standards of living in short their social status is improved , employees may get bonuses

increased since the business is performing well. eg in the uk since 2008 has experienced a rise in GDP , the median wages of employees has increased, which means that company profits has increased hence the tax revenue paid by the companies to the government has also increased. When tax revenues increase it means that the government can improve other sectors of the economy such as health which are essential for the wellbeing of the society.

Automation can benefit the economy of the country as more firms are built and well run, more -profits are made and enables governments to receive more tax revenue to spend on public goods or other sectors of the government to improve the country and therefore boosts the development of the country

On the other hand automation in car manufacturing requires significant capital investment and the benefits may take several years to exceed current production methods thus high initial capital to start is required.

Some machinery depend on electricity , thus may delay the production of cars in case there is power cut off , resulting in loss of potential buyers due to delays. When such incidents occur it means that the company is more likely to run at a loss.

Impact on equality . The process of automation has coincided with a rise in levels of inequality. There are many reasons for the rise inequality but the fear is that some benefit from automation more than others likes of the riches vs the poor, riches are to benefit much from automation.

Automation also demands a certain skills and educational training on operating those automated equipment or machines, resulting in the less fortunate being on the bedside as they are replaced by the brilliant ones who can operate those equipments. So their previously hand operated jobs vanish in the hands of automation

Moving further on impacts we look on environmental impacts that car manufacturing industries may bring

Landscape -The buildings built for manufacturing sites may beautify the environment making it more pleasing to eye sight

Despite its good impact on the environment it may affect it negatively too through likes of, Air Emissions, Industry is a major cause of air pollution, since the operation of factories results in the emission of pollutants, including organic solvents, respirable particles, sulphur dioxide (SO₂) and nitrogen oxides (NO_x). These pollutants can both harm public health and damage the environment by contributing to global phenomena such as climate change, the greenhouse effect, ozone hole and increasing desertification.

Also leads to waste water, the sources of effluent – treated or untreated wastewater that is discharged into surface waters – are many and varied. Effluent can come from industrial outlet. Industrial effluents are only a small fraction of the waste, but their environmental damage has the potential to be greater than that of domestic (municipal) wastewater. Untreated wastewater can cause environmental woes including: pollution of

groundwater reservoirs, damage of transport and wastewater treatment systems, and degradation of treated wastewater and sludge such that it would disqualify them from being used for agricultural purposes. (Much of Israel's treated wastewater is used for irrigation; hence it is important to reduce wastewater pollutants such as salts and heavy metals, which could damage vegetation and contaminate soil and groundwater

Adding on the above stated we have Land Pollution, Car manufacturing industries are one of the main causes of land contamination . Examples of soil pollution sources are garages, metal treatment and coating factories, Soil contamination is caused by direct exposure to the pollutant. The properties of soil result in pollutants remaining in the soil long after the pollution incident.